SEQUENCE LISTING

<110> Funahashi, Shin-ichi
      Miyata, Shoji

<120> PROTEIN HAVING PDZ DOMAIN SEQUENCE

<130> 06501/056001

<140> US 09/502,698
<141> 2000-02-11

<150> PCT/JP98/03603
<151> 1998-08-12

<150> JP 10/189944
<151> 1998-06-19

<150> JP 09/230356
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1               5               10              15
Asp Ser Leu Asp Leu Cys Asp Ile Glu Leu Thr Glu Lys Pro His Val
            20              25              30
Asp Leu Gly Glu Phe Ile Gly Ser Ser Glu Thr Glu Asp Pro Val Leu
        35              40              45
Ala Met Thr Asp Ala Gly Gln Ser Thr Glu Glu Val Gln Ala Pro Leu
    50              55              60
Ala Met Trp Glu Ala Gly Ile Gln His Ile Glu Leu Glu Lys Gly Ser
65              70              75              80
Lys Gly Leu Gly Phe Ser Ile Leu Asp Tyr Gln Asp Pro Ile Asp Pro
            85              90              95
Ala Ser Thr Val Ile Ile Ile Arg Ser Leu Val Pro Gly Gly Ile Ala
            100             105             110
Glu Lys Asp Gly Arg Leu Leu Pro Gly Asp Arg Leu Met Phe Val Asn
        115             120             125
Asp Val Asn Leu Glu Asn Ser Ser Leu Glu Glu Ala Val Glu Ala Leu
    130             135             140
Lys Gly Ala Pro Ser Gly Thr Val Arg Ile Gly Val Ala Lys Pro Leu
145             150             155             160
Pro Leu Ser Pro Glu Glu Gly Tyr Val Ser Ala Lys Glu Asp Ser Phe
            165             170             175
Leu Tyr Pro Pro His Ser Cys Glu Glu Ala Gly Leu Ala Asp Lys Pro
            180             185             190
Leu Phe Arg Ala Asp Leu Ala Leu Val Gly Thr Asn Asp Ala Asp Leu
        195             200             205
Val Asp Glu Ser Thr Phe Glu Ser Pro Tyr Ser Pro Glu Asn Asp Ser
    210             215             220
Ile Tyr Ser Thr Gln Ala Ser Ile Leu Ser Leu His Gly Ser Ser Cys
225             230             235             240
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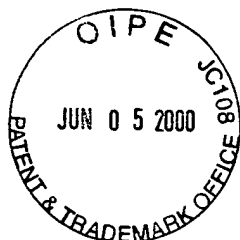
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Gly Asp Gly Leu Asn Tyr Gly Ser Ser Leu Pro Ser Ser Pro Pro Lys
            245                 250             255
Asp Val Ile Glu Asn Ser Cys Asp Pro Val Leu Asp Leu His Met Ser
            260                 265             270
Leu Glu Glu Leu Tyr Thr Gln Asn Leu Leu Glu Arg Gln Asp Glu Asn
            275                 280             285
Thr Pro Ser Val Asp Ile Ser Met Gly Pro Ala Ser Gly Phe Thr Ile
            290                 295             300
Asn Asp Tyr Thr Pro Ala Asn Ala Ile Glu Gln Gln Tyr Glu Cys Glu
305                 310             315             320
Asn Thr Ile Val Trp Thr Glu Ser His Leu Pro Ser Glu Val Ile Ser
            325                 330             335
Ser Ala Glu Leu Pro Ser Val Leu Pro Asp Ser Ala Gly Lys Gly Ser
            340                 345             350
Glu His Leu Leu Glu Gln Ser Ser Leu Ala Cys Asn Ala Glu Cys Val
            355                 360             365
Met Leu Gln Asn Val Ser Lys Glu Ser Phe Glu Arg Thr Ile Asn Ile
    370                 375             380
Ala Lys Gly Asn Ser Ser Leu Gly Met Thr Val Ser Ala Asn Lys Asp
385                 390             395             400
Gly Leu Gly Met Ile Val Arg Ser Ile Ile His Gly Gly Ala Ile Ser
            405                 410             415
Arg Asp Gly Arg Ile Ala Ile Gly Asp Cys Ile Leu Ser Ile Asn Glu
            420                 425             430
Glu Ser Thr Ile Ser Val Thr Asn Ala Gln Ala Arg Ala Met Leu Arg
            435                 440             445
Arg His Ser Leu Ile Gly Pro Asp Ile Lys Ile Thr Tyr Val Pro Ala
    450                 455             460
Glu His Leu Glu Glu Phe Lys Ile Ser Leu Gly Gln Gln Ser Gly Arg
465                 470             475             480
Val Met Ala Leu Asp Ile Phe Ser Ser Tyr Thr Gly Arg Asp Ile Pro
            485                 490             495
Glu Leu Pro Glu Arg Glu Glu Gly Glu Gly Glu Glu Ser Glu Leu Gln
            500                 505             510
Asn Thr Ala Tyr Ser Asn Trp Asn Gln Pro Arg Arg Val Glu Leu Trp
            515                 520             525
Arg Glu Pro Ser Lys Ser Leu Gly Ile Ser Ile Val Gly Gly Arg Gly
    530                 535             540
Met Gly Ser Arg Leu Ser Asn Gly Glu Val Met Arg Gly Ile Phe Ile
545                 550             555             560
Lys His Val Leu Glu Asp Ser Pro Ala Gly Lys Asn Gly Thr Leu Lys
            565                 570             575
Pro Gly Asp Arg Ile Val Glu Ala Pro Ser Gln Ser Glu Ser Glu Pro
            580                 585             590
Glu Lys Ala Pro Leu Cys Ser Val Pro Pro Pro Pro Ser Ala Phe
    595                 600             605
Ala Glu Met Gly Ser Asp His Thr Gln Ser Ser Ala Ser Lys Ile Ser
    610                 615             620
Gln Asp Val Asp Lys Glu Asp Glu Phe Gly Tyr Ser Trp Lys Asn Ile
625                 630             635             640
Arg Glu Arg Tyr Gly Thr Leu Thr Gly Glu Leu His Met Ile Glu Leu
            645                 650             655
Glu Lys Gly His Ser Gly Leu Gly Leu Ser Leu Ala Gly Asn Lys Asp
            660                 665             670
Arg Ser Arg Met Ser Val Phe Ile Val Gly Ile Asp Pro Asn Gly Ala
    675                 680             685
Ala Gly Lys Asp Gly Arg Leu Gln Ile Ala Asp Glu Leu Leu Glu Ile
    690                 695             700
Asn Gly Gln Ile Leu Tyr Gly Arg Ser His Gln Asn Ala Ser Ser Ile
705                 710             715             720
Ile Lys Cys Ala Pro Ser Lys Val Lys Ile Ile Phe Ile Arg Asn Lys
            725                 730             735
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Asp Ala Val Asn Gln Met Ala Val Cys Pro Gly Asn Ala Val Glu Pro
       740   745   750

Leu Pro Ser Asn Ser Glu Asn Leu Gln Asn Lys Glu Thr Glu Pro Thr
       755   760   765

Val Thr Thr Ser Asp Ala Ala Val Asp Leu Ser Ser Phe Lys Asn Val
       770   775   780

Gln His Leu Glu Leu Pro Lys Asp Gln Gly Gly Leu Gly Ile Ala Ile
785   790   795   800

Ser Glu Glu Asp Thr Leu Ser Gly Val Ile Ile Lys Ser Leu Thr Glu
          805   810   815

His Gly Val Ala Ala Thr Asp Gly Arg Leu Lys Val Gly Asp Gln Ile
       820   825   830

Leu Ala Val Asp Asp Glu Ile Val Val Gly Tyr Pro Ile Glu Lys Phe
       835   840   845

Ile Ser Leu Leu Lys Thr Ala Lys Met Thr Val Lys Leu Thr Ile His
       850   855   860

Ala Glu Asn Pro Asp Ser Gln Ala Val Pro Ser Ala Ala Gly Ala Ala
865   870   875   880

Ser Gly Glu Lys Lys Asn Ser Ser Gln Ser Leu Met Val Pro Gln Ser
          885   890   895

Gly Ser Pro Glu Pro Glu Ser Ile Arg Asn Thr Ser Arg Ser Ser Thr
          900   905   910

Pro Ala Ile Phe Ala Ser Asp Pro Ala Thr Cys Pro Ile Ile Pro Gly
       915   920   925

Cys Glu Thr Thr Ile Glu Ile Ser Lys Gly Arg Thr Gly Leu Gly Leu
       930   935   940

Ser Ile Val Gly Gly Ser Asp Thr Leu Leu Gly Ala Phe Ile Ile His
945   950   955   960

Glu Val Tyr Glu Glu Gly Ala Ala Cys Lys Asp Gly Arg Leu Trp Ala
          965   970   975

Gly Asp Gln Ile Leu Glu Val Asn Gly Ile Asp Leu Arg Lys Ala Thr
          980   985   990

His Asp Glu Ala Ile Asn Val Leu Arg Gln Thr Pro Gln Arg Val Arg
       995   1000   1005

Leu Thr Leu Tyr Arg Asp Glu Ala Pro Tyr Lys Glu Glu Glu Val Cys
     1010   1015   1020

Asp Thr Leu Thr Ile Glu Leu Gln Lys Lys Pro Gly Lys Gly Leu Gly
1025   1030   1035   1040

Leu Ser Ile Val Gly Lys Arg Asn Asp Thr Gly Val Phe Val Ser Asp
          1045   1050   1055

Ile Val Lys Gly Gly Ile Ala Asp Pro Asp Gly Arg Leu Ile Gln Gly
          1060   1065   1070

Asp Gln Ile Leu Leu Val Asn Gly Glu Asp Val Arg Asn Ala Ser Gln
          1075   1080   1085

Glu Ala Val Ala Ala Leu Leu Lys Cys Ser Leu Gly Thr Val Thr Leu
          1090   1095   1100

Glu Val Gly Arg Ile Lys Ala Gly Pro Phe His Ser Glu Arg Arg Pro
1105   1110   1115   1120

Ser Gln Thr Ser Gln Val Ser Glu Gly Ser Leu Ser Ser Phe Thr Phe
          1125   1130   1135

Pro Leu Ser Gly Ser Ser Thr Ser Glu Ser Leu Glu Ser Ser Ser Lys
          1140   1145   1150

Lys Asn Ala Leu Ala Ser Glu Ile Gln Gly Leu Arg Thr Val Glu Met
          1155   1160   1165

Lys Lys Gly Pro Thr Asp Ser Leu Gly Ile Ser Ile Ala Gly Gly Val
          1170   1175   1180

Gly Ser Pro Leu Gly Asp Val Pro Ile Phe Ile Ala Met Met His Pro
1185   1190   1195   1200

Thr Gly Val Ala Ala Gln Thr Gln Lys Leu Arg Val Gly Asp Arg Ile
          1205   1210   1215

Val Thr Ile Cys Gly Thr Ser Thr Glu Gly Met Thr His Thr Gln Ala
          1220   1225   1230

```
Val Asn Leu Leu Lys Asn Ala Ser Gly Ser Ile Glu Met Gln Val Val
        1235            1240            1245
Ala Gly Gly Asp Val Ser Val Val Thr Gly His His Gln Glu Pro Ala
    1250            1255            1260
Ser Ser Ser Leu Ser Phe Thr Gly Leu Thr Ser Thr Ser Ile Phe Gln
1265            1270            1275            1280
Asp Asp Leu Gly Pro Pro Gln Cys Lys Ser Ile Thr Leu Glu Arg Gly
            1285            1290            1295
Pro Asp Gly Leu Gly Phe Ser Ile Val Gly Gly Tyr Gly Ser Pro His
            1300            1305            1310
Gly Asp Leu Pro Ile Tyr Val Lys Thr Val Phe Ala Lys Gly Ala Ala
            1315            1320            1325
Ser Glu Asp Gly Arg Leu Lys Arg Gly Asp Gln Ile Ile Ala Val Asn
    1330            1335            1340
Gly Gln Ser Leu Glu Gly Val Thr His Glu Glu Ala Val Ala Ile Leu
1345            1350            1355            1360
Lys Arg Thr Lys Gly Thr Val Thr Leu Met Val Leu Ser
            1365            1370
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<213> Homo sapiens

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Ala Lys Gly Asn Ser Ser Leu Gly Met Thr Val Ser Ala Asn Lys Asp
            20              25              30
Gly Leu Gly Met Ile Val Arg Ser Ile Ile His Gly Gly Ala Ile Ser
        35              40              45
Arg Asp Gly Arg Ile Ala Ile Gly Asp Cys Ile Leu Ser Ile Asn Glu
    50              55              60
Glu Ser Thr Ile Ser Val Thr Asn Ala Gln Ala Arg Ala Met Leu Arg
65              70              75              80
Arg His Ser Leu Ile Gly Pro Asp Ile Lys Ile Thr Tyr Val Pro Ala
            85              90              95
Glu His Leu Glu Glu Phe Lys Ile Ser Leu Gly Gln Gln Ser Gly Arg
            100             105             110
Val Met Ala Leu Asp Ile Phe Ser Ser Tyr Thr Gly Arg Asp Ile Pro
    115             120             125
Glu Leu Pro Glu Arg Glu Glu Gly Glu Gly Glu Glu Ser Glu Leu Gln
    130             135             140
Asn Thr Ala Tyr Ser Asn Trp Asn Gln Pro Arg Arg Val Glu Leu Trp
145             150             155             160
Arg Glu Pro Ser Lys Ser Leu Gly Ile Ser Ile Val Gly Gly Arg Gly
            165             170             175
Met Gly Ser Arg Leu Ser Asn Gly Glu Val Met Arg Gly Ile Phe Ile
            180             185             190
Lys His Val Leu Glu Asp Ser Pro Ala Gly Lys Asn Gly Thr Leu Lys
            195             200             205
Pro Gly Asp Arg Ile Val Glu Ala Pro Ser Gln Ser Glu Ser Glu Pro
    210             215             220
Glu Lys Ala Pro Leu Cys Ser Val Pro Pro Pro Pro Ser Ala Phe
225             230             235             240
Ala Glu Met Gly Ser Asp His Thr Gln Ser Ser Ala Ser Lys Ile Ser
            245             250             255
Gln Asp Val Asp Lys Glu Asp Glu Phe Gly Tyr Ser Trp Lys Asn Ile
            260             265             270
Arg Glu Arg Tyr Gly Thr Leu Thr Gly Glu Leu His Met Ile Glu Leu
    275             280             285
```

```
Glu Lys Gly His Ser Gly Leu Gly Leu Ser Leu Ala Gly Asn Lys Asp
    290             295             300
Arg Ser Arg Met Ser Val Phe Ile Val Gly Ile Asp Pro Asn Gly Ala
305             310             315             320
Ala Gly Lys Asp Gly Arg Leu Gln Ile Ala Asp Glu Leu Leu Glu Ile
            325             330             335
Asn Gly Gln Ile Leu Tyr Gly Arg Ser His Gln Asn Ala Ser Ser Ile
            340             345             350
Ile Lys Cys Ala Pro Ser Lys Val Lys Ile Ile Phe Ile Arg Asn Lys
        355             360             365
Asp Ala Val Asn Gln Met Ala Val Cys Pro Gly Asn Ala Val Glu Pro
    370             375             380
Leu Pro Ser Asn Ser Glu Asn Leu Gln Asn Lys Glu Thr Glu Pro Thr
385             390             395             400
Val Thr Thr Ser Asp Ala Ala Val Asp Leu Ser Ser Phe Lys Asn Val
            405             410             415
Gln His Leu Glu Leu Pro Lys Asp Gln Gly Gly Leu Gly Ile Ala Ile
        420             425             430
Ser Glu Glu Asp Thr Leu Ser Gly Val Ile Ile Lys Ser Leu Thr Glu
        435             440             445
His Gly Val Ala Ala Thr Asp Gly Arg Leu Lys Val Gly Asp Gln Ile
    450             455             460
Leu Ala Val Asp Asp Glu Ile Val Val Gly Tyr Pro Ile Glu Lys Phe
465             470             475             480
Ile Ser Leu Leu Lys Thr Ala Lys Met Thr Val Lys Leu Thr Ile His
            485             490             495
Ala Glu Asn Pro Asp Ser Gln Ala Val Pro Ser Ala Ala Gly Ala Ala
            500             505             510
Ser Gly Glu Lys Lys Asn Ser Ser Gln Ser Leu Met Val Pro Gln Ser
        515             520             525
Gly Ser Pro Glu Pro Glu Ser Ile Arg Asn Thr Ser Arg Ser Ser Thr
    530             535             540
Pro Ala Ile Phe Ala Ser Asp Pro Ala Thr Cys Pro Ile Ile Pro Gly
545             550             555             560
Cys Glu Thr Thr Ile Glu Ile Ser Lys Gly Arg Thr Gly Leu Gly Leu
            565             570             575
Ser Ile Val Gly Gly Ser Asp Thr Leu Leu Gly Ala Phe Ile Ile His
            580             585             590
Glu Val Tyr Glu Glu Gly Ala Ala Cys Lys Asp Gly Arg Leu Trp Ala
        595             600             605
Gly Asp Gln Ile Leu Glu Val Asn Gly Ile Asp Leu Arg Lys Ala Thr
    610             615             620
His Asp Glu Ala Ile Asn Val Leu Arg Gln Thr Pro Gln Arg Val Arg
625             630             635             640
Leu Thr Leu Tyr Arg Asp Glu Ala Pro Tyr Lys Glu Glu Glu Val Cys
            645             650             655
Asp Thr Leu Thr Ile Glu Leu Gln Lys Lys Pro Gly Lys Gly Leu Gly
            660             665             670
Leu Ser Ile Val Gly Lys Arg Asn Asp Thr Gly Val Phe Val Ser Asp
        675             680             685
Ile Val Lys Gly Gly Ile Ala Asp Pro Asp Gly Arg Leu Ile Gln Gly
    690             695             700
Asp Gln Ile Leu Leu Val Asn Gly Glu Asp Val Arg Asn Ala Ser Gln
705             710             715             720
Glu Ala Val Ala Ala Leu Leu Lys Cys Ser Leu Gly Thr Val Thr Leu
            725             730             735
Glu Val Gly Arg Ile Lys Ala Gly Pro Phe His Ser Glu Arg Arg Pro
        740             745             750
Ser Gln Thr Ser Gln Val Ser Glu Gly Ser Leu Ser Ser Phe Thr Phe
        755             760             765
Pro Leu Ser Gly Ser Ser Thr Ser Glu Ser Leu Glu Ser Ser Ser Lys
    770             775             780
```

```
Lys Asn Ala Leu Ala Ser Glu Ile Gln Gly Leu Arg Thr Val Glu Met
785             790             795             800
Lys Lys Gly Pro Thr Asp Ser Leu Gly Ile Ser Ile Ala Gly Gly Val
            805             810             815
Gly Ser Pro Leu Gly Asp Val Pro Ile Phe Ile Ala Met Met His Pro
            820             825             830
Thr Gly Val Ala Ala Gln Thr Gln Lys Leu Arg Val Gly Asp Arg Ile
            835             840             845
Val Thr Ile Cys Gly Thr Ser Thr Glu Gly Met Thr His Thr Gln Ala
        850             855             860
Val Asn Leu Leu Lys Asn Ala Ser Gly Ser Ile Glu Met Gln Val Val
865             870             875             880
Ala Gly Gly Asp Val Ser Val Val Thr Gly His His Gln Glu Pro Ala
            885             890             895
Ser Ser Ser Leu Ser Phe Thr Gly Leu Thr Ser Thr Ser Ile Phe Gln
            900             905             910
Asp Asp Leu Gly Pro Pro Gln Cys Lys Ser Ile Thr Leu Glu Arg Gly
        915             920             925
Pro Asp Gly Leu Gly Phe Ser Ile Val Gly Gly Tyr Gly Ser Pro His
930             935             940
Gly Asp Leu Pro Ile Tyr Val Lys Thr Val Phe Ala Lys Gly Ala Ala
945             950             955             960
Ser Glu Asp Gly Arg Leu Lys Arg Gly Asp Gln Ile Ile Ala Val Asn
            965             970             975
Gly Gln Ser Leu Glu Gly Val Thr His Glu Glu Ala Val Ala Ile Leu
        980             985             990
Lys Arg Thr Lys Gly Thr Val Thr Leu Met Val Leu Ser
        995             1000            1005
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<210> 3
<211> 4880
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (292)...(4410)

<400> 3

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ttggacacag cgggaagctc ttcagtggag acgagctatt ggaaaataag taacgcattc     120
agatgtttaa aatcacagag aatacaaaga taaagaatgg aaaagggtct ccttcctgtc     180
ccaattcatc cagttctcat caccccttcat taggtaaatg gcataacttt acttggggaa     240
aatcaccaag atgtggtgaa tatcttaaaa gaactgccta tagaagtgac a atg gtg     297
                                                          Met Val
                                                           1

tgc tgt cgt cga act gtg cca ccc acc acc caa tca gaa ttg gat agc      345
Cys Cys Arg Arg Thr Val Pro Pro Thr Thr Gln Ser Glu Leu Asp Ser
          5                   10                  15

ctg gac tta tgt gat att gag cta aca gaa aag cct cac gta gat cta      393
Leu Asp Leu Cys Asp Ile Glu Leu Thr Glu Lys Pro His Val Asp Leu
      20                  25                  30

ggt gag ttc atc ggg tca tca gag aca gag gat cca gtg ctg gcg atg      441
Gly Glu Phe Ile Gly Ser Ser Glu Thr Glu Asp Pro Val Leu Ala Met
  35                  40                  45                  50

act gat gcg ggt cag agt aca gaa gag gtt caa gca cct ttg gcc atg      489
Thr Asp Ala Gly Gln Ser Thr Glu Glu Val Gln Ala Pro Leu Ala Met
              55                  60                  65
```

```
tgg gag gct ggc att cag cac ata gag ctg gag aaa ggg agc aaa gga          537
Trp Glu Ala Gly Ile Gln His Ile Glu Leu Glu Lys Gly Ser Lys Gly
            70                  75                  80

ctt ggt ttt agc att tta gat tat cag gat cca att gat cca gca agc          585
Leu Gly Phe Ser Ile Leu Asp Tyr Gln Asp Pro Ile Asp Pro Ala Ser
            85                  90                  95

act gtg att ata att cgt tct ttg gtg cct ggc ggc att gct gaa aag          633
Thr Val Ile Ile Ile Arg Ser Leu Val Pro Gly Gly Ile Ala Glu Lys
    100                 105                 110

gat gga cga ctt ctt cct ggt gac cga ctc atg ttt gta aac gat gtt          681
Asp Gly Arg Leu Leu Pro Gly Asp Arg Leu Met Phe Val Asn Asp Val
115                 120                 125                 130

aac ttg gaa aac agc agt ctt gag gaa gct gta gaa gca ctg aag gga          729
Asn Leu Glu Asn Ser Ser Leu Glu Glu Ala Val Glu Ala Leu Lys Gly
            135                 140                 145

gca ccg tca ggg act gtg aga ata gga gtt gct aag cct tta ccc ctt          777
Ala Pro Ser Gly Thr Val Arg Ile Gly Val Ala Lys Pro Leu Pro Leu
            150                 155                 160

tca cca gaa gaa ggt tat gtt tct gct aag gag gat tcc ttt ctc tac          825
Ser Pro Glu Glu Gly Tyr Val Ser Ala Lys Glu Asp Ser Phe Leu Tyr
            165                 170                 175

cca cca cac tcc tgt gag gaa gca ggg ctg gct gac aaa ccc ctc ttc          873
Pro Pro His Ser Cys Glu Glu Ala Gly Leu Ala Asp Lys Pro Leu Phe
            180                 185                 190

agg gct gac ttg gct ctg gtg ggc aca aat gat gct gac tta gta gat          921
Arg Ala Asp Leu Ala Leu Val Gly Thr Asn Asp Ala Asp Leu Val Asp
195                 200                 205                 210

gaa tcc aca ttt gag tct cca tac tct cct gaa aat gac agc atc tac          969
Glu Ser Thr Phe Glu Ser Pro Tyr Ser Pro Glu Asn Asp Ser Ile Tyr
            215                 220                 225

tct act caa gcc tct att tta tct ctt cat ggc agt tct tgt ggt gat          1017
Ser Thr Gln Ala Ser Ile Leu Ser Leu His Gly Ser Ser Cys Gly Asp
            230                 235                 240

ggc ctg aac tat ggt tct tcc ctt cca tca tct cct cct aag gat gtt          1065
Gly Leu Asn Tyr Gly Ser Ser Leu Pro Ser Ser Pro Pro Lys Asp Val
            245                 250                 255

att gaa aat tct tgt gat cca gta ctt gat ctg cat atg tct ctg gag          1113
Ile Glu Asn Ser Cys Asp Pro Val Leu Asp Leu His Met Ser Leu Glu
    260                 265                 270

gaa cta tat acc cag aat ctc ctg gaa aga cag gat gag aat aca cct          1161
Glu Leu Tyr Thr Gln Asn Leu Leu Glu Arg Gln Asp Glu Asn Thr Pro
275                 280                 285                 290

tcg gtg gac ata agt atg ggg cct gct tct ggc ttt act ata aat gac          1209
Ser Val Asp Ile Ser Met Gly Pro Ala Ser Gly Phe Thr Ile Asn Asp
            295                 300                 305
```

```
tac aca cct gca aat gct att gaa caa caa tat gaa tgt gaa aac aca      1257
Tyr Thr Pro Ala Asn Ala Ile Glu Gln Gln Tyr Glu Cys Glu Asn Thr
            310             315             320

ata gtg tgg act gaa tct cat tta cca agt gaa gtt ata tca agt gca      1305
Ile Val Trp Thr Glu Ser His Leu Pro Ser Glu Val Ile Ser Ser Ala
            325             330             335

gaa ctt cct tct gtg cta ccc gat tca gct gga aag ggc tct gag cac      1353
Glu Leu Pro Ser Val Leu Pro Asp Ser Ala Gly Lys Gly Ser Glu His
    340             345             350

ctg ctt gaa cag agc tcc ctg gcc tgt aat gct gag tgt gtc atg ctt      1401
Leu Leu Glu Gln Ser Ser Leu Ala Cys Asn Ala Glu Cys Val Met Leu
355             360             365             370

caa aat gta tct aaa gaa tct ttt gaa agg act att aat ata gca aaa      1449
Gln Asn Val Ser Lys Glu Ser Phe Glu Arg Thr Ile Asn Ile Ala Lys
            375             380             385

ggc aat tct agc cta gga atg aca gtt agt gct aat aaa gat ggc ttg      1497
Gly Asn Ser Ser Leu Gly Met Thr Val Ser Ala Asn Lys Asp Gly Leu
            390             395             400

ggg atg atc gtt cga agc att att cat gga ggt gcc att agt cga gat      1545
Gly Met Ile Val Arg Ser Ile Ile His Gly Gly Ala Ile Ser Arg Asp
            405             410             415

ggc cgg att gcc att ggg gac tgc atc ttg tcc att aat gaa gag tct      1593
Gly Arg Ile Ala Ile Gly Asp Cys Ile Leu Ser Ile Asn Glu Glu Ser
            420             425             430

acc atc agt gta acc aat gcc cag gca cga gct atg ttg aga aga cat      1641
Thr Ile Ser Val Thr Asn Ala Gln Ala Arg Ala Met Leu Arg Arg His
435             440             445             450

tct ctc att ggc cct gac ata aaa att act tat gtg cct gca gaa cat      1689
Ser Leu Ile Gly Pro Asp Ile Lys Ile Thr Tyr Val Pro Ala Glu His
            455             460             465

ttg gaa gag ttc aaa ata agc ttg gga caa caa tct gga aga gta atg      1737
Leu Glu Glu Phe Lys Ile Ser Leu Gly Gln Gln Ser Gly Arg Val Met
            470             475             480

gca ctg gat att ttt tct tca tac act ggc aga gac att cca gaa tta      1785
Ala Leu Asp Ile Phe Ser Ser Tyr Thr Gly Arg Asp Ile Pro Glu Leu
            485             490             495

cca gag cga gaa gag gga gag ggt gaa gaa agc gaa ctt caa aac aca      1833
Pro Glu Arg Glu Glu Gly Glu Gly Glu Glu Ser Glu Leu Gln Asn Thr
    500             505             510

gca tat agc aat tgg aat cag ccc agg cgg gtg gaa ctc tgg aga gaa      1881
Ala Tyr Ser Asn Trp Asn Gln Pro Arg Arg Val Glu Leu Trp Arg Glu
515             520             525             530

cca agc aaa tcc tta ggc atc agc att gtt ggt gga cga ggg atg ggg      1929
Pro Ser Lys Ser Leu Gly Ile Ser Ile Val Gly Gly Arg Gly Met Gly
            535             540             545
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agt cgg cta agc aat gga gaa gtg atg agg ggc att ttc atc aaa cat    1977
Ser Arg Leu Ser Asn Gly Glu Val Met Arg Gly Ile Phe Ile Lys His
        550                 555             560

gtt ctg gaa gat agt cca gct ggc aaa aat gga acc ttg aaa cct gga    2025
Val Leu Glu Asp Ser Pro Ala Gly Lys Asn Gly Thr Leu Lys Pro Gly
        565                 570             575

gat aga atc gta gag gca ccc agt cag tca gag tca gag cca gag aag    2073
Asp Arg Ile Val Glu Ala Pro Ser Gln Ser Glu Ser Glu Pro Glu Lys
    580                 585             590

gct cca ttg tgc agt gtg ccc cca ccc cct cct tca gcc ttt gcc gaa    2121
Ala Pro Leu Cys Ser Val Pro Pro Pro Pro Ser Ala Phe Ala Glu
595                 600             605                 610

atg ggt agt gat cac aca cag tca tct gca agc aaa atc tca caa gat    2169
Met Gly Ser Asp His Thr Gln Ser Ser Ala Ser Lys Ile Ser Gln Asp
                615             620                 625

gtg gac aaa gag gat gag ttt ggt tac agc tgg aaa aat atc aga gag    2217
Val Asp Lys Glu Asp Glu Phe Gly Tyr Ser Trp Lys Asn Ile Arg Glu
        630                 635             640

cgt tat gga acc cta aca ggc gag ctg cat atg att gaa ctg gag aaa    2265
Arg Tyr Gly Thr Leu Thr Gly Glu Leu His Met Ile Glu Leu Glu Lys
        645                 650             655

ggt cat agt ggt ttg ggc cta agt ctt gct ggg aac aaa gac cga tcc    2313
Gly His Ser Gly Leu Gly Leu Ser Leu Ala Gly Asn Lys Asp Arg Ser
    660                 665             670

agg atg agt gtc ttc ata gtg ggg att gat cca aat gga gct gca gga    2361
Arg Met Ser Val Phe Ile Val Gly Ile Asp Pro Asn Gly Ala Ala Gly
675                 680             685                 690

aaa gat ggt cga ttg caa att gca gat gag ctt cta gag atc aat ggt    2409
Lys Asp Gly Arg Leu Gln Ile Ala Asp Glu Leu Leu Glu Ile Asn Gly
            695             700                 705

cag att tta tat gga aga agt cat cag aat gcc tca tca atc att aaa    2457
Gln Ile Leu Tyr Gly Arg Ser His Gln Asn Ala Ser Ser Ile Ile Lys
            710             715                 720

tgt gcc cct tct aaa gtg aaa ata att ttt atc aga aat aaa gat gca    2505
Cys Ala Pro Ser Lys Val Lys Ile Ile Phe Ile Arg Asn Lys Asp Ala
        725                 730                 735

gtg aat cag atg gcc gta tgt cct gga aat gca gta gaa cct-ttg cct    2553
Val Asn Gln Met Ala Val Cys Pro Gly Asn Ala Val Glu Pro Leu Pro
    740                 745                 750

tct aac tca gaa aat ctt caa aat aag gag aca gag cca act gtt act    2601
Ser Asn Ser Glu Asn Leu Gln Asn Lys Glu Thr Glu Pro Thr Val Thr
755                 760                 765                 770

act tct gat gca gct gtg gac ctc agt tca ttt aaa aat gtg caa cat    2649
Thr Ser Asp Ala Ala Val Asp Leu Ser Ser Phe Lys Asn Val Gln His
            775                 780                 785
```

```
ctg gag ctt ccc aag gat cag ggg ggt ttg ggt att gct atc agc gaa      2697
Leu Glu Leu Pro Lys Asp Gln Gly Gly Leu Gly Ile Ala Ile Ser Glu
            790                 795                 800

gaa gat aca ctc agt gga gtc atc ata aag agc tta aca gag cat ggg      2745
Glu Asp Thr Leu Ser Gly Val Ile Ile Lys Ser Leu Thr Glu His Gly
            805                 810                 815

gta gca gcc acg gat gga cga ctc aaa gtc gga gat cag ata ctg gct      2793
Val Ala Ala Thr Asp Gly Arg Leu Lys Val Gly Asp Gln Ile Leu Ala
    820                 825                 830

gta gat gat gaa att gtt gtt ggt tac cct att gaa aag ttt att agc      2841
Val Asp Asp Glu Ile Val Val Gly Tyr Pro Ile Glu Lys Phe Ile Ser
835                 840                 845                 850

ctt ctg aag aca gca aag atg aca gta aaa ctt acc atc cat gct gag      2889
Leu Leu Lys Thr Ala Lys Met Thr Val Lys Leu Thr Ile His Ala Glu
                855                 860                 865

aat cca gat tcc cag gct gtt cct tca gca gct ggt gca gcc agt gga      2937
Asn Pro Asp Ser Gln Ala Val Pro Ser Ala Ala Gly Ala Ala Ser Gly
            870                 875                 880

gaa aaa aag aac agc tcc cag tct ctg atg gtc cca cag tct ggc tcc      2985
Glu Lys Lys Asn Ser Ser Gln Ser Leu Met Val Pro Gln Ser Gly Ser
            885                 890                 895

cca gaa ccg gag tcc atc cga aat aca agc aga tca tca aca cca gca      3033
Pro Glu Pro Glu Ser Ile Arg Asn Thr Ser Arg Ser Ser Thr Pro Ala
            900                 905                 910

att ttt gct tct gat cct gca acc tgc ccc att atc cct ggc tgc gaa      3081
Ile Phe Ala Ser Asp Pro Ala Thr Cys Pro Ile Ile Pro Gly Cys Glu
915                 920                 925                 930

aca acc atc gag att tcc aaa ggg cga aca ggg ctg ggc ctg agc atc      3129
Thr Thr Ile Glu Ile Ser Lys Gly Arg Thr Gly Leu Gly Leu Ser Ile
                935                 940                 945

gtt ggg ggt tca gac acg ctg ctg ggt gcc ttt att atc cat gaa gtt      3177
Val Gly Gly Ser Asp Thr Leu Leu Gly Ala Phe Ile Ile His Glu Val
            950                 955                 960

tat gaa gaa gga gca gca tgt aaa gat gga aga ctc tgg gct gga gat      3225
Tyr Glu Glu Gly Ala Ala Cys Lys Asp Gly Arg Leu Trp Ala Gly Asp
            965                 970                 975

cag atc tta gag gtg aat gga att gac ttg agg aag gcc aca cat gat      3273
Gln Ile Leu Glu Val Asn Gly Ile Asp Leu Arg Lys Ala Thr His Asp
    980                 985                 990

gaa gca atc aat gtc ctg aga cag acg cca cag aga gtg cgc ctg aca      3321
Glu Ala Ile Asn Val Leu Arg Gln Thr Pro Gln Arg Val Arg Leu Thr
     995                 1000                1005                1010

ctc tac aga gat gag gcc cca tac aaa gag gag gaa gtg tgt gac acc      3369
Leu Tyr Arg Asp Glu Ala Pro Tyr Lys Glu Glu Glu Val Cys Asp Thr
            1015                1020                1025
```

```
ctc act att gag ctg cag aag aag ccg gga aaa ggc cta gga tta agt      3417
Leu Thr Ile Glu Leu Gln Lys Lys Pro Gly Lys Gly Leu Gly Leu Ser
            1030                1035                1040

att gtt ggt aaa aga aac gat act gga gta ttt gtg tca gac att gtc      3465
Ile Val Gly Lys Arg Asn Asp Thr Gly Val Phe Val Ser Asp Ile Val
            1045                1050                1055

aaa gga gga att gca gat ccc gat gga aga ctg atc cag gga gac cag      3513
Lys Gly Gly Ile Ala Asp Pro Asp Gly Arg Leu Ile Gln Gly Asp Gln
        1060                1065                1070

ata tta ttg gtg aat ggg gaa gac gtt cgt aat gcc tcc caa gaa gcg      3561
Ile Leu Leu Val Asn Gly Glu Asp Val Arg Asn Ala Ser Gln Glu Ala
1075                1080                1085                1090

gtt gcc gct ttg cta aag tgt tcc cta ggc aca gta acc ttg gaa gtt      3609
Val Ala Ala Leu Leu Lys Cys Ser Leu Gly Thr Val Thr Leu Glu Val
            1095                1100                1105

gga aga atc aaa gct ggt cca ttc cat tca gag agg agg cca tct caa      3657
Gly Arg Ile Lys Ala Gly Pro Phe His Ser Glu Arg Arg Pro Ser Gln
            1110                1115                1120

acc agc cag gtg agt gaa ggc agc ctg tct tct ttc act ttt cca ctc      3705
Thr Ser Gln Val Ser Glu Gly Ser Leu Ser Ser Phe Thr Phe Pro Leu
            1125                1130                1135

tct gga tcc agt aca tct gag tca ctg gaa agt agc tca aag aag aat      3753
Ser Gly Ser Ser Thr Ser Glu Ser Leu Glu Ser Ser Ser Lys Lys Asn
            1140                1145                1150

gca ttg gca tct gaa ata cag gga tta aga aca gtc gaa atg aaa aag      3801
Ala Leu Ala Ser Glu Ile Gln Gly Leu Arg Thr Val Glu Met Lys Lys
1155                1160                1165                1170

ggc cct act gac tca ctg gga atc agc atc gct gga gga gta ggc agc      3849
Gly Pro Thr Asp Ser Leu Gly Ile Ser Ile Ala Gly Gly Val Gly Ser
            1175                1180                1185

cca ctt ggt gat gtg cct ata ttt att gca atg atg cac cca act gga      3897
Pro Leu Gly Asp Val Pro Ile Phe Ile Ala Met Met His Pro Thr Gly
            1190                1195                1200

gtt gca gca cag acc caa aaa ctc aga gtt ggg gat agg att gtc acc      3945
Val Ala Ala Gln Thr Gln Lys Leu Arg Val Gly Asp Arg Ile Val Thr
            1205                1210                1215

atc tgt ggc aca tcc act gag ggc atg act cac acc caa gca gtt aac      3993
Ile Cys Gly Thr Ser Thr Glu Gly Met Thr His Thr Gln Ala Val Asn
            1220                1225                1230

cta ctg aaa aat gca tct ggc tcc att gaa atg cag gtg gtt gct gga      4041
Leu Leu Lys Asn Ala Ser Gly Ser Ile Glu Met Gln Val Val Ala Gly
1235                1240                1245                1250

gga gac gtg agt gtg gtc aca ggt cat cat cag gag cct gca agt tcc      4089
Gly Asp Val Ser Val Val Thr Gly His His Gln Glu Pro Ala Ser Ser
            1255                1260                1265
```

```
agt ctt tct ttc act ggg ctg acg tca acc agt ata ttt cag gat gat     4137
Ser Leu Ser Phe Thr Gly Leu Thr Ser Thr Ser Ile Phe Gln Asp Asp
            1270            1275            1280

tta gga cct cct caa tgt aag tct att aca cta gag cga gga cca gat     4185
Leu Gly Pro Pro Gln Cys Lys Ser Ile Thr Leu Glu Arg Gly Pro Asp
            1285            1290            1295        .

ggc tta ggc ttc agt ata gtt gga gga tat ggc agc cct cat gga gac     4233
Gly Leu Gly Phe Ser Ile Val Gly Gly Tyr Gly Ser Pro His Gly Asp
            1300            1305            1310

tta ccc att tat gtt aaa aca gtg ttt gca aag gga gca gcc tct gaa     4281
Leu Pro Ile Tyr Val Lys Thr Val Phe Ala Lys Gly Ala Ala Ser Glu
1315            1320            1325            1330

gac gga cgt ctg aaa agg ggc gat cag atc att gct gtc aat ggg cag     4329
Asp Gly Arg Leu Lys Arg Gly Asp Gln Ile Ile Ala Val Asn Gly Gln
            1335            1340            1345

agt cta gaa gga gtc acc cat gaa gaa gct gtt gcc atc ctt aaa cgg     4377
Ser Leu Glu Gly Val Thr His Glu Glu Ala Val Ala Ile Leu Lys Arg
            1350            1355            1360

aca aaa ggc act gtc act ttg atg gtt ctc tct tgaattggct gccagaattg   4430
Thr Lys Gly Thr Val Thr Leu Met Val Leu Ser
            1365            1370

aaccaaccca acccctagct cacctcctac tgtaaagaga atgcactggt cctgacaatt    4490
tttatgctgt gttcagccgg gtcttcaaaa ctgtaggggg gaaataacac ttaagtttct    4550
ttttctcatc tagaaatgct ttccttactg acaacctaac atcattttc ttttcttctt     4610
gcattttgtg aacttaaaga gaaggaatat ttgtgtaggt gaatctcgtt tttatttgtg    4670
gagatatcta atgttttgta gtcacatggg caagaattat tacatgctaa gctggttagt    4730
ataaagaaag ataattctaa agctaaccaa agaaatggc ttcagtaagt taggatgaaa      4790
aatgaaaata taaataaag aagaaaatct cggggagttt aaaaaaaatg cctcaatttg      4850
gcaatctacc tcctctcccc accccaaact                                     4880
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<210> 4
<211> 90
<212> PRT
<213> Homo sapiens

<400> 4
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Ala Gly Ile Gln His Ile Glu Leu Glu Lys Gly Ser Lys Gly Leu Gly
 1               5              10                  15
Phe Ser Ile Leu Asp Tyr Gln Asp Pro Ile Asp Pro Ala Ser Thr Val
            20              25              30
Ile Ile Ile Arg Ser Leu Val Pro Gly Gly Ile Ala Glu Lys Asp Gly
            35              40  .           45
Arg Leu Leu Pro Gly Asp Arg Leu Met Phe Val Asn Asp Val Asn Leu
    50              55              60
Glu Asn Ser Ser Leu Glu Gly Ala Val Glu Ala Leu Lys Gly Ala Pro
 65              70              75                  80
Ser Gly Thr Val Arg Ile Gly Val Ala Lys
                85              90
```

<210> 5
<211> 91
<212> PRT
<213> Homo sapiens

<400> 5

```
Gln Asn Val Ser Lys Glu Ser Phe Glu Arg Thr Ile Asn Ile Ala Lys
 1               5                   10              15
Gly Asn Ser Ser Leu Gly Met Thr Val Ser Ala Asn Lys Asp Gly Leu
            20                  25                  30
Gly Met Ile Val Arg Ser Ile Ile His Gly Gly Ala Ile Ser Arg Asp
            35                  40                  45
Gly Arg Ile Ala Ile Gly Asp Cys Ile Leu Ser Ile Asn Glu Glu Ser
        50                  55                  60
Thr Ile Ser Val Thr Asn Ala Gln Ala Arg Ala Met Leu Arg Arg His
65                  70                  75                  80
Ser Leu Ile Gly Pro Asp Ile Lys Ile Thr Tyr
                85                  90
```

<210> 6
<211> 96
<212> PRT
<213> Homo sapiens

<400> 6

```
Asn Gln Pro Arg Arg Val Glu Leu Trp Arg Glu Pro Ser Lys Ser Leu
 1               5                   10              15
Gly Ile Ser Ile Val Gly Gly Arg Gly Met Gly Ser Arg Leu Ser Asn
            20                  25                  30
Gly Glu Val Met Arg Gly Ile Phe Ile Lys His Val Leu Glu Asp Ser
            35                  40                  45
Pro Ala Gly Lys Asn Gly Thr Leu Lys Pro Gly Asp Arg Ile Val Glu
        50                  55                  60
Ala Pro Ser Gln Ser Glu Ser Glu Pro Glu Lys Ala Pro Leu Cys Ser
65                  70                  75                  80
Val Pro Pro Pro Pro Pro Ser Ala Phe Ala Glu Met Gly Ser Asp His
                85                  90                  95
```

<210> 7
<211> 86
<212> PRT
<213> Homo sapiens

<400> 7

```
Gly Glu Leu His Met Ile Glu Leu Glu Lys Gly His Ser Gly Leu Gly
 1               5                   10              15
Leu Ser Leu Ala Gly Asn Lys Asp Arg Ser Arg Met Ser Val Phe Ile
            20                  25                  30
Val Gly Ile Asp Pro Asn Gly Ala Ala Gly Lys Asp Gly Arg Leu Gln
            35                  40                  45
Ile Ala Asp Glu Leu Leu Glu Ile Asn Gly Gln Ile Leu Tyr Gly Arg
        50                  55                  60
Ser His Gln Asn Ala Ser Ser Ile Ile Lys Cys Ala Pro Ser Lys Val
65                  70                  75                  80
Lys Ile Ile Phe Ile Arg
                85
```

<210> 8
<211> 84
<212> PRT
<213> Homo sapiens

<400> 8

```
Lys Asn Val Gln His Leu Glu Leu Pro Lys Asp Gln Gly Gly Leu Gly
 1               5                   10              15
Ile Ala Ile Ser Glu Glu Asp Thr Leu Ser Gly Val Ile Ile Lys Ser
            20                  25                  30
```

Leu Thr Glu His Gly Val Ala Ala Thr Asp Gly Arg Leu Lys Val Gly
        35   40   45
Asp Gln Ile Leu Ala Val Asp Asp Glu Ile Val Val Gly Tyr Pro Ile
        50   55   60
Glu Lys Phe Ile Ser Leu Leu Lys Thr Ala Lys Met Thr Val Lys Leu
  65   70   75   80
Thr Ile His Ala

<210> 9
<211> 86
<212> PRT
<213> Homo sapiens

<400> 9
Gly Cys Glu Thr Thr Ile Glu Ile Ser Lys Gly Arg Thr Gly Leu Gly
  1   5   10   15
Leu Ser Ile Val Gly Gly Ser Asp Thr Leu Leu Gly Ala Phe Ile Ile
            20   25   30
His Glu Val Tyr Glu Glu Gly Ala Ala Cys Lys Asp Gly Arg Leu Trp
        35   40   45
Ala Gly Asp Gln Ile Leu Glu Val Asn Gly Ile Asp Leu Arg Lys Ala
        50   55   60
Thr His Asp Glu Ala Ile Asn Val Leu Arg Gln Thr Pro Gln Arg Val
  65   70   75   80
Arg Leu Thr Leu Tyr Arg
                    85

<210> 10
<211> 85
<212> PRT
<213> Homo sapiens

<400> 10
Cys Asp Thr Leu Thr Ile Glu Leu Gln Lys Lys Pro Gly Lys Gly Leu
  1   5   10   15
Gly Leu Ser Ile Val Gly Lys Arg Asn Asp Thr Gly Val Phe Val Ser
            20   25   30
Asp Ile Val Lys Gly Gly Ile Ala Asp Pro Asp Gly Arg Leu Ile Gln
        35   40   45
Gly Asp Gln Ile Leu Leu Val Asn Gly Glu Asp Val Arg Asn Ala Ser
        50   55   60
Gln Glu Ala Val Ala Ala Leu Leu Lys Cys Ser Leu Gly Thr Val Thr
  65   70   75   80
Leu Glu Val Gly Arg
                85

<210> 11
<211> 89
<212> PRT
<213> Homo sapiens

<400> 11
Gln Gly Leu Arg Thr Val Glu Met Lys Lys Gly Pro Thr Asp Ser Leu
  1   5   10   15
Gly Ile Ser Ile Ala Gly Gly Val Gly Ser Pro Leu Gly Asp Val Pro
            20   25   30
Ile Phe Ile Ala Met Met His Pro Thr Gly Val Ala Ala Gln Thr Gln
        35   40   45
Lys Leu Arg Val Gly Asp Arg Ile Val Thr Ile Cys Gly Thr Ser Thr
        50   55   60

```
Gln Gly Met Thr His Thr Gln Ala Val Asn Leu Leu Lys Asn Ala Ser
 65              70                  75                  80
Gly Ser Ile Glu Met Gln Val Val Ala
                85
```

<210> 12
<211> 88
<212> PRT
<213> Homo sapiens

<400> 12
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Pro Gln Cys Lys Ser Ile Thr Leu Glu Arg Gly Pro Asp Gly Leu Gly
 1               5                  10                  15
Phe Ser Ile Val Gly Gly Tyr Gly Ser Pro His Gly Asp Leu Pro Ile
            20                  25                  30
Tyr Val Lys Thr Val Phe Ala Lys Gly Ala Ala Ser Glu Asp Gly Arg
        35                  40                  45
Leu Lys Arg Gly Asp Gln Ile Ile Ala Val Asn Gly Gln Ser Leu Glu
    50                  55                  60
Gly Val Thr His Glu Glu Ala Val Ala Ile Leu Lys Arg Thr Lys Gly
 65              70                  75                  80
Thr Val Thr Leu Met Val Leu Ser
                85
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<210> 13
<211> 184
<212> DNA
<213> Homo sapiens

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<223> n = A,T,C or G

<400> 13
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gctattttga aaatatattt atatctacga aaagaattgg gaaaacaaat atttaatcag      60
agaattattc cttaaagatt taaaatgtat ttagttgtac attttatatg ggttcacccc     120
agcacatgaa gtataatggt cagatttatt tngtatttat ttactattat aaccactttt     180
tagg                                                                 184
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<210> 14
<211> 20
<212> DNA
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<220>
<223> Artificially synthesized primer sequence

<400> 14
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ctccccatcc ctcgtccacc                                                 20
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<210> 15
<211> 20
<212> DNA
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<220>
<223> Artificially synthesized primer sequence

<400> 15
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ctctgactct gactgactgg                                                 20
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<210> 16
<211> 20
<212> DNA
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<220>
<223> Artificially synthesized primer sequence

<400> 16
atgagtttgg ttacagctgg   20

<210> 17
<211> 20
<212> DNA
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<220>
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<400> 17
tcagagagcg ttatggaacc   20

<210> 18
<211> 20
<212> DNA
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<220>
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<400> 18
agtcttgctg ggaacaaaga   20

<210> 19
<211> 20
<212> DNA
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<220>
<223> Artificially synthesized primer sequence

<400> 19
actgttacta cttctgatgc   20

<210> 20
<211> 20
<212> DNA
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<220>
<223> Artificially synthesized primer sequence

<400> 20
tctgatggtc ccacagtctg   20

<210> 21
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<220>
<223> Artificially synthesized primer sequence

<400> 21
gttgtttcgc agccagggat   20

<210> 22
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<220>
<223> Artificially synthesized primer sequence

<400> 22
ctgagcatcg ttgggggttc   20

<210> 23
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Artificially synthesized primer sequence

<400> 23
cctcatctct gtagagtgtc   20

<210> 24
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<220>
<223> Artificially synthesized primer sequence

<400> 24
tgttagcccc ctcactaagg   20

<210> 25
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<220>
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<400> 25
gctatgtgct aggaaatacg   20

<210> 26
<211> 20
<212> DNA
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<220>
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<400> 26
tagggagaag gatcagagcg   20

<210> 27
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<220>
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<400> 27
acagatttct gactcactgg                                              20

<210> 28
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<220>
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<400> 28
tggaaatagg cattcttcag                                              20

<210> 29
<211> 20
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<220>
<223> Artificially synthesized primer sequence

<400> 29
atacaaagac ggtctaatcc                                              20

<210> 30
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<220>
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<400> 30
ccgctttccc atctttagaa ac                                           22

<210> 31
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<220>
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<400> 31
tatctcgtgt ggaagatgtg                                              20

<210> 32
<211> 20
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<220>
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<400> 32
acataaatgt tgctatcacc                                              20
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<210> 33
<211> 20
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<400> 33
tgccacttag tagccgagtg   20

<210> 34
<211> 20
<212> DNA
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<220>
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<400> 34
gcattgcatt acagttgagc   20

<210> 35
<211> 20
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<400> 35
tcctcctttg acaatgtctg   20

<210> 36
<211> 20
<212> DNA
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<400> 36
catttcgact gttcttaatc   20

<210> 37
<211> 20
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<400> 37
tcagtggatg tgccacagat   20

<210> 38
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<400> 38
cagtaggtta actgcttcgg   20

<210> 39
<211> 20
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<400> 39
agttccagtc tttctttcgg   20

<210> 40
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<400> 40
tttctttcac tgggctgaag tc   22

<210> 41
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<400> 41
cctctgaaga cggacgtctg   20

<210> 42
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<400> 42
ccatcctaat acgactcact atagggc   27

<210> 43
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Artificially synthesized primer sequence

<400> 43
ttggggtggg gagaggaggt agattgc   27

<210> 44
<211> 23
<212> DNA
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<400> 44
actcactata gggctcgagc ggc   23

<210> 45
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<212> DNA
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<400> 45
gcacatcacc aagtgggctg cctactc   27

<210> 46
<211> 20
<212> DNA
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<220>
<223> Artificially synthesized primer sequence

<400> 46
atgagtttgg ttacagctgg   20

<210> 47
<211> 20
<212> DNA
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<220>
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<400> 47
aatctaatgc agctcgcctg   20

<210> 48
<211> 20
<212> DNA
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<220>
<223> Artificially synthesized primer sequence

<400> 48
agtcttgctg ggaacaaaga   20

<210> 49
<211> 20
<212> DNA
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<220>
<223> Artificially synthesized primer sequence

<400> 49
tcactttaga aggggcacat   20

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<210> 50
<211> 20
<212> DNA
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<220>
<223> Artificially synthesized primer sequence

<400> 50
actgttacta cttctgatgc                                           20

<210> 51
<211> 20
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<220>
<223> Artificially synthesized primer sequence

<400> 51
tctgatggtc ccacagtctg                                           20

<210> 52
<211> 20
<212> DNA
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<220>
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<400> 52
gttgtttcgc agccagggat                                           20

<210> 53
<211> 20
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<220>
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<400> 53
ctgagcatcg ttgggggttc                                           20

<210> 54
<211> 20
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<400> 54
cctcatctct gtagagtgtc                                           20

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<400> 55
tagggagaag gatcagagcg   20

<210> 56
<211> 20
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<400> 56
tcctcctttg acaatgtctg   20

<210> 57
<211> 20
<212> DNA
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<220>
<223> Artificially synthesized primer sequence

<400> 57
tttcatcatc tacagccagt   20

<210> 58
<211> 20
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<400> 58
tgacaccctc actattgagc   20

<210> 59
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<212> DNA
<213> Homo sapiens

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<400> 59
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cac aca cag tca tct gca agc aaa atc tca caa gat gtg gac aaa gag   102
His Thr Gln Ser Ser Ala Ser Lys Ile Ser Gln Asp Val Asp Lys Glu
  5   10   15   20

gat gag ttt ggt tac agc tgg aaa aat atc aga gag cgt tat gga acc   150
Asp Glu Phe Gly Tyr Ser Trp Lys Asn Ile Arg Glu Arg Tyr Gly Thr
                  25   30   35

cta aca ggc gag ctg cat atg att gaa ctg gag aaa ggt cat agt ggt   198
Leu Thr Gly Glu Leu His Met Ile Glu Leu Glu Lys Gly His Ser Gly
              40   45   50

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ttg ggc cta agt ctt gct ggg aac aaa gac cga tcc agg atg agt gtc          246
Leu Gly Leu Ser Leu Ala Gly Asn Lys Asp Arg Ser Arg Met Ser Val
        55                  60                  65

ttc ata gtg ggg att gat cca aat gga gct gca gga aaa gat ggt cga          294
Phe Ile Val Gly Ile Asp Pro Asn Gly Ala Ala Gly Lys Asp Gly Arg
        70                  75                  80

ttg caa att gca gat gag ctt cta gag atc aat ggt cag att tta tat          342
Leu Gln Ile Ala Asp Glu Leu Leu Glu Ile Asn Gly Gln Ile Leu Tyr
 85                  90                  95                 100

gga aga agt cat cag aat gcc tca tca atc att aaa tgt gcc cct tct          390
Gly Arg Ser His Gln Asn Ala Ser Ser Ile Ile Lys Cys Ala Pro Ser
                105                 110                 115

aaa gtg aaa ata att ttt atc aga aat aaa gat gca gtg aat cag atg          438
Lys Val Lys Ile Ile Phe Ile Arg Asn Lys Asp Ala Val Asn Gln Met
                120                 125                 130

gcc gta tgt cct gga aat gca gta gaa cct ttg cct tct aac tca gaa          486
Ala Val Cys Pro Gly Asn Ala Val Glu Pro Leu Pro Ser Asn Ser Glu
                135                 140                 145

aat ctt caa aat aag gag cca gag cca act gtt act act tct gat gca          534
Asn Leu Gln Asn Lys Glu Pro Glu Pro Thr Val Thr Thr Ser Asp Ala
        150                 155                 160

gct gtg gac ctc agt tca ttt aaa aat gtg caa cat ctg gag ctt ccc          582
Ala Val Asp Leu Ser Ser Phe Lys Asn Val Gln His Leu Glu Leu Pro
165                 170                 175                 180

aag gat cag ggg ggt ttg ggt att gct atc agc gaa gaa gat aca ctc          630
Lys Asp Gln Gly Gly Leu Gly Ile Ala Ile Ser Glu Glu Asp Thr Leu
                185                 190                 195

agt gga gtc atc ata aag agc tta aca gag cat ggg gta gca gcc acg          678
Ser Gly Val Ile Ile Lys Ser Leu Thr Glu His Gly Val Ala Ala Thr
                200                 205                 210

gat gga cga ctc aaa gtc gga gat cag ata ctg gct gta gat gat gaa          726
Asp Gly Arg Leu Lys Val Gly Asp Gln Ile Leu Ala Val Asp Asp Glu
        215                 220                 225

att gtt gtt ggt tac cct att gaa aag ttt att agc ctt ctg aag aca          774
Ile Val Val Gly Tyr Pro Ile Glu Lys Phe Ile Ser Leu Leu Lys Thr
        230                 235                 240

gca aag atg aca gta aaa ctt acc atc cat gct gag aat cca gat tcc          822
Ala Lys Met Thr Val Lys Leu Thr Ile His Ala Glu Asn Pro Asp Ser
245                 250                 255                 260

cag gct gtt cct tca gca gct ggt gca gcc agt gga gaa aaa aag aac          870
Gln Ala Val Pro Ser Ala Ala Gly Ala Ala Ser Gly Glu Lys Lys Asn
                265                 270                 275

agc tcc cag tct ctg atg gtc cca cag tct ggc tcc cca gaa ccg gag          918
Ser Ser Gln Ser Leu Met Val Pro Gln Ser Gly Ser Pro Glu Pro Glu
                280                 285                 290
```

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tcc atc cga aat aca agc aga tca tca aca cca gca att ttt gct tct        966
Ser Ile Arg Asn Thr Ser Arg Ser Ser Thr Pro Ala Ile Phe Ala Ser
        295             300             305

gat cct gca acc tgc ccc att atc cct ggc tgc gaa aca acc atc gag       1014
Asp Pro Ala Thr Cys Pro Ile Ile Pro Gly Cys Glu Thr Thr Ile Glu
        310             315             320

att tcc aaa ggg cga aca ggg ctg ggc ctg agc atc gtt ggg ggt tca      1062
Ile Ser Lys Gly Arg Thr Gly Leu Gly Leu Ser Ile Val Gly Gly Ser
325             330             335             340

gac acg ctg ctg ggt gcc ttt att atc cat gaa gtt tat gaa gaa gga      1110
Asp Thr Leu Leu Gly Ala Phe Ile Ile His Glu Val Tyr Glu Glu Gly
            345             350             355

gca gca tgt aaa gat gga aga ctc tgg gct gga gat cag atc tta gag      1158
Ala Ala Cys Lys Asp Gly Arg Leu Trp Ala Gly Asp Gln Ile Leu Glu
        360             365             370

gtg aat gga att gac ttg agg aag gcc aca cat gat gaa gca atc aat      1206
Val Asn Gly Ile Asp Leu Arg Lys Ala Thr His Asp Glu Ala Ile Asn
        375             380             385

gtc ctg aga cag acg cca cag aga gtg cgc ctg aca ctc tac aga gat      1254
Val Leu Arg Gln Thr Pro Gln Arg Val Arg Leu Thr Leu Tyr Arg Asp
        390             395             400

gag gcc cca tac aaa gag gag gaa gtg tgt gac acc ctc act att gag      1302
Glu Ala Pro Tyr Lys Glu Glu Glu Val Cys Asp Thr Leu Thr Ile Glu
405             410             415             420

ctg cag aag aag ccg gga aaa ggc cta gga tta agt att gtt ggt aaa      1350
Leu Gln Lys Lys Pro Gly Lys Gly Leu Gly Leu Ser Ile Val Gly Lys
            425             430             435

aga aac gat act gga gta ttt gtg tca gac att gtc aaa gga gga att      1398
Arg Asn Asp Thr Gly Val Phe Val Ser Asp Ile Val Lys Gly Gly Ile
            440             445             450

gca gat ccc gat gga aga ctg atc cag gga gac cag ata tta ttg gtg      1446
Ala Asp Pro Asp Gly Arg Leu Ile Gln Gly Asp Gln Ile Leu Leu Val
            455             460             465

aat ggg gaa gac gtt cgt aat gcc tcc caa gaa gcg gtt gcc gct ttg      1494
Asn Gly Glu Asp Val Arg Asn Ala Ser Gln Glu Ala Val Ala Ala Leu
            470             475             480

cta aag tgt tcc cta ggc aca gta acc ttg gaa gtt gga aga atc aaa      1542
Leu Lys Cys Ser Leu Gly Thr Val Thr Leu Glu Val Gly Arg Ile Lys
485             490             495             500

gct ggt cca ttc cat tca gag agg agg cca tct caa acc agc cag gtg      1590
Ala Gly Pro Phe His Ser Glu Arg Arg Pro Ser Gln Thr Ser Gln Val
            505             510             515

agt gaa ggc agc ctg tct tct ttc act ttt cca ctc tct gga tcc agt      1638
Ser Glu Gly Ser Leu Ser Ser Phe Thr Phe Pro Leu Ser Gly Ser Ser
            520             525             530
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aca tct gag tca ctg gaa agt agc tca aag aag aat gca ttg gca tct      1686
Thr Ser Glu Ser Leu Glu Ser Ser Ser Lys Lys Asn Ala Leu Ala Ser
        535             540             545

gaa ata cag gga tta aga aca gtc gaa atg aaa aag ggc cct act gac      1734
Glu Ile Gln Gly Leu Arg Thr Val Glu Met Lys Lys Gly Pro Thr Asp
        550             555             560

tca ctg gga atc agc atc gct gga gga gta ggc agc cca ctt ggt gat      1782
Ser Leu Gly Ile Ser Ile Ala Gly Gly Val Gly Ser Pro Leu Gly Asp
565             570             575             580

gtg cct ata ttt att gca atg atg cac cca act gga gtt gca gca cag      1830
Val Pro Ile Phe Ile Ala Met Met His Pro Thr Gly Val Ala Ala Gln
        585             590             595

acc caa aaa ctc aga gtt ggg gat agg att gtc acc atc tgt ggc aca      1878
Thr Gln Lys Leu Arg Val Gly Asp Arg Ile Val Thr Ile Cys Gly Thr
        600             605             610

tcc act gag ggc atg act cac acc caa gca gtt aac cta ctg aaa aat      1926
Ser Thr Glu Gly Met Thr His Thr Gln Ala Val Asn Leu Leu Lys Asn
        615             620             625

gca tct ggc tcc att gaa atg cag gtg gtt gct gga gga gac gtg agt      1974
Ala Ser Gly Ser Ile Glu Met Gln Val Val Ala Gly Gly Asp Val Ser
        630             635             640

gtg gtc aca ggt cat cat cag gag cct gca agt tcc agt ctt tct ttc      2022
Val Val Thr Gly His His Gln Glu Pro Ala Ser Ser Ser Leu Ser Phe
645             650             655             660

act ggg ctg acg tca acc agt ata ttt cag gat gat tta gga cct cct      2070
Thr Gly Leu Thr Ser Thr Ser Ile Phe Gln Asp Asp Leu Gly Pro Pro
        665             670             675

caa tgt aag tct att aca cta gag cga gga cca gat ggc tta ggc ttc      2118
Gln Cys Lys Ser Ile Thr Leu Glu Arg Gly Pro Asp Gly Leu Gly Phe
        680             685             690

agt ata gtt gga gga tat ggc agc cct cat gga gac tta ccc att tat      2166
Ser Ile Val Gly Gly Tyr Gly Ser Pro His Gly Asp Leu Pro Ile Tyr
        695             700             705

gtt aaa aca gtg ttt gca aag gga gca gcc tct gaa gac gga cgt ctg      2214
Val Lys Thr Val Phe Ala Lys Gly Ala Ala Ser Glu Asp Gly Arg Leu
        710             715             720

aaa agg ggc gat cag atc att gct gtc aat ggg cag agt cta gaa gga      2262
Lys Arg Gly Asp Gln Ile Ile Ala Val Asn Gly Gln Ser Leu Glu Gly
725             730             735             740

gtc acc cat gaa gaa gct gtt gcc atc ctt aaa cgg aca aaa ggc act      2310
Val Thr His Glu Glu Ala Val Ala Ile Leu Lys Arg Thr Lys Gly Thr
        745             750             755

gtc act ttg atg gtt ctc tct tgaattggct gccagaattg aaccaaccca        2361
Val Thr Leu Met Val Leu Ser
        760

acccctagct cacctcctac tgtaaagaga atgcactggt cctgacaatt tttatgctgt    2421
gttcagccgg gtcttcaaaa ctgtaggggg gaaataacac ttaagtttct ttttctcatc    2481
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tagaaatgct ttccttactg acaacctaac atcatttttc ttttcttctt gcattttgtg   2541
aacttaaaga gaaggaatat ttgtgtaggt gaatctcgtt tttatttgtg gagatatcta   2601
atgttttgta gtcacatggg caagaattat tacatgctaa gctggttagt ataaagaaag   2661
ataattctaa agctaaccaa agaaaatggc ttcagtaagt taggatgaaa aatgaaaata   2721
taaaataaag aagaaaatct cggggagttt aaaaaaaatg cctcaatttg gcaatctacc   2781
tcctctcccc accccaaact aaaaaaaaaa aaaaaaa                            2819
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<220>
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gcccttagga cgcgtaatac gactc   25

<210> 61
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
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<400> 61
agccagtatc tgatctccga ctttg   25

<210> 62
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
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<400> 62
attttcactt tagaaggggc acat   24

<210> 63
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<212> DNA
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ggcataactt tacttacttg   20

<210> 64
<211> 20
<212> DNA
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atctactaag tcagcatcat   20

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ttccttctgt gctacccgat   20

<210> 67
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<212> DNA
<213> Artificial Sequence

<220>
<223> Artificially synthesized primer sequence

<400> 67
ggactatctt ccagaacatg   20

<210> 68
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<212> DNA
<213> Artificial Sequence

<220>
<223> Artificially synthesized primer sequence

<400> 68
atcgggtcca ttccattcag agagg   25

<210> 69
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Artificially synthesized primer sequence

<400> 69
aattgtcaag agagaaccat caaagtgg   28

<210> 70
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<212> DNA
<213> Artificial Sequence

<220>
<223> Artificially synthesized primer sequence

<400> 70
atcgatgggt agtaatcaca cacag   25

<210> 71
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Artificially synthesized primer sequence

<400> 71
aattgctata ctggatccag agagtgg   27

<210> 72
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
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<400> 72
Val Asp Lys Glu Asp Glu Phe Gly Tyr Ser Trp Lys Asn Ile Arg Glu
 1   5   10   15
Arg Tyr Gly Cys Gly
            20

<210> 73
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Artificially synthesized primer sequence

<400> 73
tttgtgccca ccagagccaa gtcag   25

<210> 74
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Artificially synthesized primer sequence

<400> 74
gtgaaagggg taaaggctta gcaac   25

<210> 75
<211> 1776
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (3)...(1772)

<400> 75

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ca att aca cat cag cag gct atc agc atc ctg cag aaa gcc aaa gat       47
   Ile Thr His Gln Gln Ala Ile Ser Ile Leu Gln Lys Ala Lys Asp
    1               5               10                  15

acc gtc cag cta gtt att gcc aga ggc tca ttg cct cag ctt gtc agc     95
Thr Val Gln Leu Val Ile Ala Arg Gly Ser Leu Pro Gln Leu Val Ser
               20              25                  30

ccc ata gtt tcc cgt tct cca tct gca gcc agc aca att tca gct cac    143
Pro Ile Val Ser Arg Ser Pro Ser Ala Ala Ser Thr Ile Ser Ala His
               35              40                  45

tct aat ccg gtt cac tgg caa cac atg gaa acg att gaa ttg gtg aat    191
Ser Asn Pro Val His Trp Gln His Met Glu Thr Ile Glu Leu Val Asn
           50                  55                  60

gat gga tct ggt ttg gga ttt ggc atc ata gga gga aaa gca act ggt    239
Asp Gly Ser Gly Leu Gly Phe Gly Ile Ile Gly Gly Lys Ala Thr Gly
       65                  70                  75

gtg ata gta aaa acc att ctg cct gga gga gta gct gat cag cat ggg    287
Val Ile Val Lys Thr Ile Leu Pro Gly Gly Val Ala Asp Gln His Gly
 80                  85                  90                  95

cgt tta tgc agt gga gac cac att cta aag att ggt gac aca gat cta    335
Arg Leu Cys Ser Gly Asp His Ile Leu Lys Ile Gly Asp Thr Asp Leu
               100             105                 110

gca gga atg agc agt gag caa gta gca caa gtc ctt agg caa tgt gga    383
Ala Gly Met Ser Ser Glu Gln Val Ala Gln Val Leu Arg Gln Cys Gly
               115             120                 125

aat aga gtt aag ttg atg att gca aga agt gcc ata gaa gaa cgt aca    431
Asn Arg Val Lys Leu Met Ile Ala Arg Ser Ala Ile Glu Glu Arg Thr
           130                 135                 140

gca ccc act gct ttg ggc atc acc ctc tcc tca tcc cca act tca acg    479
Ala Pro Thr Ala Leu Gly Ile Thr Leu Ser Ser Ser Pro Thr Ser Thr
           145                 150                 155

cca gag ttg cgg gtt gat gct tct act cag aaa ggt gaa gaa agt gag    527
Pro Glu Leu Arg Val Asp Ala Ser Thr Gln Lys Gly Glu Glu Ser Glu
160                 165                 170                 175

aca ttt gat gta gaa ctc act aaa aat gtc caa gga tta gga att acc    575
Thr Phe Asp Val Glu Leu Thr Lys Asn Val Gln Gly Leu Gly Ile Thr
               180                 185                 190

att gct ggc tac att gga gat aaa aaa ttg gaa cct tca gga atc ttt    623
Ile Ala Gly Tyr Ile Gly Asp Lys Lys Leu Glu Pro Ser Gly Ile Phe
               195                 200                 205

gta aag agc att aca aaa agc agt gcc gtt gag cat gat gga aga atc    671
Val Lys Ser Ile Thr Lys Ser Ser Ala Val Glu His Asp Gly Arg Ile
               210                 215                 220

caa att gga gac caa att ata gca gta gat ggc aca aac ctt cag ggt    719
Gln Ile Gly Asp Gln Ile Ile Ala Val Asp Gly Thr Asn Leu Gln Gly
               225                 230                 235
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ttt act aat cag caa gca gta gag gta ttg cga cat aca gga caa act        767
Phe Thr Asn Gln Gln Ala Val Glu Val Leu Arg His Thr Gly Gln Thr
240             245             250             255

gtg ctc ctg aca cta atg agg aga gga atg aag cag gaa gcc gag ctc        815
Val Leu Leu Thr Leu Met Arg Arg Gly Met Lys Gln Glu Ala Glu Leu
            260             265             270

atg tca agg gaa gac gtc aca aaa gat gca gat ttg tct cct gtt aat        863
Met Ser Arg Glu Asp Val Thr Lys Asp Ala Asp Leu Ser Pro Val Asn
            275             280             285

gcc agc ata atc aaa gaa aat tat gaa aaa gat gaa gat ttt tta tct        911
Ala Ser Ile Ile Lys Glu Asn Tyr Glu Lys Asp Glu Asp Phe Leu Ser
            290             295             300

tcg acg aga aac acc aac ata tta cca act gaa gaa gaa ggg tat cca        959
Ser Thr Arg Asn Thr Asn Ile Leu Pro Thr Glu Glu Glu Gly Tyr Pro
            305             310             315

tta ctg tca gct gag ata gaa gaa ata gaa gat gca caa aaa caa gaa        1007
Leu Leu Ser Ala Glu Ile Glu Glu Ile Glu Asp Ala Gln Lys Gln Glu
320             325             330             335

gct gct ctg ctg aca aaa tgg caa agg att atg gga att aac tat gaa        1055
Ala Ala Leu Leu Thr Lys Trp Gln Arg Ile Met Gly Ile Asn Tyr Glu
            340             345             350

ata gtg gtg gcc cat gtg agc aag ttt agt gag aac agt gga ttg ggg        1103
Ile Val Val Ala His Val Ser Lys Phe Ser Glu Asn Ser Gly Leu Gly
            355             360             365

ata agc ctg gaa gcg aca gtg gga cat cat ttt atc cga tct gtt cta        1151
Ile Ser Leu Glu Ala Thr Val Gly His His Phe Ile Arg Ser Val Leu
            370             375             380

cca gag ggt cct gtt gga cac agc ggg aag ctc ttc agt gga gac gag        1199
Pro Glu Gly Pro Val Gly His Ser Gly Lys Leu Phe Ser Gly Asp Glu
            385             390             395

cta ttg gaa gta aat ggc ata act tta ctt ggg gaa aat cac caa gat        1247
Leu Leu Glu Val Asn Gly Ile Thr Leu Leu Gly Glu Asn His Gln Asp
400             405             410             415

gtg gtg aat atc tta aaa gaa ctg cct ata gaa gtg aca atg gtg tgc        1295
Val Val Asn Ile Leu Lys Glu Leu Pro Ile Glu Val Thr Met Val Cys
            420             425             430

tgt cgt cga act gtg cca ccc acc acc caa tca gaa ttg gat agc ctg        1343
Cys Arg Arg Thr Val Pro Pro Thr Thr Gln Ser Glu Leu Asp Ser Leu
            435             440             445

gac tta tgt gat att gag cta aca gaa aag cct cac gta gat cta ggt        1391
Asp Leu Cys Asp Ile Glu Leu Thr Glu Lys Pro His Val Asp Leu Gly
            450             455             460

gag ttc atc ggg tca tca gag cca gag gat cca gtg ctg gcg atg act        1439
Glu Phe Ile Gly Ser Ser Glu Pro Glu Asp Pro Val Leu Ala Met Thr
465             470             475
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gat gcg ggt cag agt aca gaa gag gtt caa gca cct ttg gcc atg tgg      1487
Asp Ala Gly Gln Ser Thr Glu Glu Val Gln Ala Pro Leu Ala Met Trp
480                     485                 490                 495

gag gct ggc att cag cac ata atg ctg gag aaa ggg agc aaa gga ctt      1535
Glu Ala Gly Ile Gln His Ile Met Leu Glu Lys Gly Ser Lys Gly Leu
                    500                 505                 510

ggt ttt agc att tta gat tat cag gat cca att gat cca gca agc act      1583
Gly Phe Ser Ile Leu Asp Tyr Gln Asp Pro Ile Asp Pro Ala Ser Thr
                515                 520                 525

gtg att ata att cgt tct ttg gtg cct ggc ggc att gct gaa aag gat      1631
Val Ile Ile Ile Arg Ser Leu Val Pro Gly Gly Ile Ala Glu Lys Asp
            530                 535                 540

gga cga ctt ctt cct ggt gac cga ctc atg ttt gta aac gat gtt aac      1679
Gly Arg Leu Leu Pro Gly Asp Arg Leu Met Phe Val Asn Asp Val Asn
            545                 550                 555

ttg gaa aac agc agt ctt gag gaa gct gta gaa gca ctg aag gga gca      1727
Leu Glu Asn Ser Ser Leu Glu Glu Ala Val Glu Ala Leu Lys Gly Ala
560                 565                 570                 575

ccg tca ggg act gtg aga ata gga gtt gct aag cct tta ccc ctt          1772
Pro Ser Gly Thr Val Arg Ile Gly Val Ala Lys Pro Leu Pro Leu
                580                 585                 590

tcac                                                                 1776
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<210> 76
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Artificially synthesized primer sequence

<400> 76
gcagatggag aacgggaaac tatgg                                            25

<210> 77
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Artificially synthesized primer sequence

<400> 77
gaacgggaaa ctatggggct gacaa                                            25


<210> 78
<211> 777
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (71)...(775)
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<400> 78

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            Met Leu Glu Ala Ile Asp Lys Asn Arg Ala Leu His Ala
            1               5                   10

gca gag cgc ttg caa acc aag ctg cga gaa cgt ggg gat gta gca aat       157
Ala Glu Arg Leu Gln Thr Lys Leu Arg Glu Arg Gly Asp Val Ala Asn
    15              20                  25

gaa gac aaa ctg agc ctt ctg aag tca gtc ctg cag agc cct ctc ttc       205
Glu Asp Lys Leu Ser Leu Leu Lys Ser Val Leu Gln Ser Pro Leu Phe
 30              35                  40                      45

agt cag att ctg agc ctt cag act tct gta cag cag ctg aaa gac cag       253
Ser Gln Ile Leu Ser Leu Gln Thr Ser Val Gln Gln Leu Lys Asp Gln
                50                  55                  60

gta aat att gca act tca gca act tca aat att gaa tat gcc cac gtt       301
Val Asn Ile Ala Thr Ser Ala Thr Ser Asn Ile Glu Tyr Ala His Val
                65                  70                  75

cct cat ctc agc cca gct gtg att cct act ctg caa aat gaa tcg ttt       349
Pro His Leu Ser Pro Ala Val Ile Pro Thr Leu Gln Asn Glu Ser Phe
            80                  85                  90

tta tta tcc cca aac aat ggg aat ctg gaa gca ctt aca gga cct ggt       397
Leu Leu Ser Pro Asn Asn Gly Asn Leu Glu Ala Leu Thr Gly Pro Gly
        95                  100                 105

att cca cac att aat ggg aaa cct gct tgt gat gaa ttt gat cag ctt       445
Ile Pro His Ile Asn Gly Lys Pro Ala Cys Asp Glu Phe Asp Gln Leu
110                 115                 120                 125

atc aaa aat atg gcc cag ggt cgc cat gta gaa gtt ttt gag ctc ctc       493
Ile Lys Asn Met Ala Gln Gly Arg His Val Glu Val Phe Glu Leu Leu
                130                 135                 140

aaa cct cca tct gga ggc ctt ggg ttt agt gtt gtg gga cta aga agt       541
Lys Pro Pro Ser Gly Gly Leu Gly Phe Ser Val Val Gly Leu Arg Ser
                145                 150                 155

gaa aac aga gga gag ctg gga ata ttt gtt caa gag ata caa gag ggc       589
Glu Asn Arg Gly Glu Leu Gly Ile Phe Val Gln Glu Ile Gln Glu Gly
            160                 165                 170

agt gtg gcc cat aga gat gga aga ttg aaa gaa act gat caa att ctt       637
Ser Val Ala His Arg Asp Gly Arg Leu Lys Glu Thr Asp Gln Ile Leu
        175                 180                 185

gct atc aat gga cag gct ctt gat cag aca att aca cat cag cag gct       685
Ala Ile Asn Gly Gln Ala Leu Asp Gln Thr Ile Thr His Gln Gln Ala
190                 195                 200                 205

atc agc atc ctg cag aaa gcc aaa gat act gtc cag cta gtt att gcc       733
Ile Ser Ile Leu Gln Lys Ala Lys Asp Thr Val Gln Leu Val Ile Ala
                210                 215                 220

aga ggc tca ttg cct cag ctt gtc agc ccc ata gtt tcc cgt tc           777
Arg Gly Ser Leu Pro Gln Leu Val Ser Pro Ile Val Ser Arg
                225                 230                 235
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<210> 79
<211> 755
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (3)...(755)

<400> 79
tt cct tct gtg cta ccc gat tca gct gga aag ggc tct gag tac ctg          47
   Pro Ser Val Leu Pro Asp Ser Ala Gly Lys Gly Ser Glu Tyr Leu
    1               5              10                     15

ctt gaa cag agc tcc ctg gcc tgt aat gct gag tgt gtc atg ctt caa         95
Leu Glu Gln Ser Ser Leu Ala Cys Asn Ala Glu Cys Val Met Leu Gln
                  20              25                  30

aat gta tct aaa gaa tct ttt gaa agg act att aat ata gca aaa ggc        143
Asn Val Ser Lys Glu Ser Phe Glu Arg Thr Ile Asn Ile Ala Lys Gly
              35                  40                  45

aat tct agc cta gga atg aca gtt agt gct aat aaa gat ggc ttg ggg        191
Asn Ser Ser Leu Gly Met Thr Val Ser Ala Asn Lys Asp Gly Leu Gly
          50                  55                  60

atg atc gtt cga agc att att cat gga ggt gcc att agt cga gat ggc        239
Met Ile Val Arg Ser Ile Ile His Gly Gly Ala Ile Ser Arg Asp Gly
     65                  70                  75

cgg att gcc att ggg gac tgc atc ttg tcc att aat gaa gag tct acc        287
Arg Ile Ala Ile Gly Asp Cys Ile Leu Ser Ile Asn Glu Glu Ser Thr
 80                  85                  90                  95

atc agt gta acc aat gcc cag gca cga gct atg ttg aga aga cat tct        335
Ile Ser Val Thr Asn Ala Gln Ala Arg Ala Met Leu Arg Arg His Ser
                 100                 105                 110

ctc att ggc cct gac ata aaa att act tat gtg cct gca gaa cat ttg        383
Leu Ile Gly Pro Asp Ile Lys Ile Thr Tyr Val Pro Ala Glu His Leu
             115                 120                 125

gaa gag ttc aaa ata agc ttg gga caa caa tct gga aga gta atg gca        431
Glu Glu Phe Lys Ile Ser Leu Gly Gln Gln Ser Gly Arg Val Met Ala
             130                 135                 140

ctg gat att ttt tct tca tac act ggc aga gac att cca gaa tta cca        479
Leu Asp Ile Phe Ser Ser Tyr Thr Gly Arg Asp Ile Pro Glu Leu Pro
145                 150                 155

gag cga gaa gag gga gag ggt gaa gaa agc gaa ctt caa aac aca gca        527
Glu Arg Glu Glu Gly Glu Gly Glu Glu Ser Glu Leu Gln Asn Thr Ala
160                 165                 170                 175

tat agc aat tgg aat cag ccc agg cgg gtg gaa ctc tgg aga gaa cca        575
Tyr Ser Asn Trp Asn Gln Pro Arg Arg Val Glu Leu Trp Arg Glu Pro
                 180                 185                 190

agc aaa tcc tta ggc atc agc att gtt ggt gga cga ggg atg ggg agt        623
Ser Lys Ser Leu Gly Ile Ser Ile Val Gly Gly Arg Gly Met Gly Ser
             195                 200                 205
```

```
cgg cta agc aat gga gaa gtg atg agg ggc att ttc atc aaa cat gtt      671
Arg Leu Ser Asn Gly Glu Val Met Arg Gly Ile Phe Ile Lys His Val
        210             215             220

ctg gaa gat agt cca gct ggc aaa aat gga acc ttg aaa cct gga gat      719
Leu Glu Asp Ser Pro Ala Gly Lys Asn Gly Thr Leu Lys Pro Gly Asp
    225             230             235

aga atc gta gag gca ccc agt cag tca gag tca gag                      755
Arg Ile Val Glu Ala Pro Ser Gln Ser Glu Ser Glu
240             245             250
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<210> 80
<211> 865
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (3)...(818)

<400> 80
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tt cct tct gtg cta ccc gat tca gct gga aag ggc tct gag tac ctg       47
   Pro Ser Val Leu Pro Asp Ser Ala Gly Lys Gly Ser Glu Tyr Leu
   1           5               10                  15

ctt gaa cag agc tcc ctg gcc tgt aat gct gag tgt gtc atg ctt caa      95
Leu Glu Gln Ser Ser Leu Ala Cys Asn Ala Glu Cys Val Met Leu Gln
            20              25                  30

aat gta tct aaa gaa tct ttt gaa agg act att aat ata gca aaa ggc     143
Asn Val Ser Lys Glu Ser Phe Glu Arg Thr Ile Asn Ile Ala Lys Gly
            35              40                  45

aat tct agc cta gga atg aca gtt agt gct aat aaa gat ggc ttg ggg     191
Asn Ser Ser Leu Gly Met Thr Val Ser Ala Asn Lys Asp Gly Leu Gly
        50              55              60

atg atc gtt cga agc att att cat gga ggt gcc att agt cga gat ggc     239
Met Ile Val Arg Ser Ile Ile His Gly Gly Ala Ile Ser Arg Asp Gly
    65              70              75

cgg att gcc att ggg gac tgc atc ttg tcc att aat gaa gag tct acc     287
Arg Ile Ala Ile Gly Asp Cys Ile Leu Ser Ile Asn Glu Glu Ser Thr
80              85              90                  95

atc agt gta acc aat gcc cag gca cga gct atg ttg aga aga cat tct     335
Ile Ser Val Thr Asn Ala Gln Ala Arg Ala Met Leu Arg Arg His Ser
                100             105             110

ctc att ggc cct gac ata aaa att act tat gtg cct gca gaa cat ttg     383
Leu Ile Gly Pro Asp Ile Lys Ile Thr Tyr Val Pro Ala Glu His Leu
            115             120             125

gaa gag ttc aaa ata agc ttg gga caa caa tct gga aga gta atg gca     431
Glu Glu Phe Lys Ile Ser Leu Gly Gln Gln Ser Gly Arg Val Met Ala
            130             135             140

ctg gat att ttt tct tca tac act ggc aga gac att cca gaa tta cca     479
Leu Asp Ile Phe Ser Ser Tyr Thr Gly Arg Asp Ile Pro Glu Leu Pro
    145             150             155
```

```
gag cga gaa gag gga gag ggt gaa gaa agc gaa ctt caa aac aca gca      527
Glu Arg Glu Glu Gly Glu Gly Glu Glu Ser Glu Leu Gln Asn Thr Ala
160             165             170             175

tat agc aat tgg aat cag ccc agg cgg gtg gaa ctc tgg aga gaa cca      575
Tyr Ser Asn Trp Asn Gln Pro Arg Arg Val Glu Leu Trp Arg Glu Pro
                180             185             190

agc aaa tcc tta ggc atc agc att gtt ggt gga cga ggg atg ggg agt      623
Ser Lys Ser Leu Gly Ile Ser Ile Val Gly Gly Arg Gly Met Gly Ser
            195             200             205

cgg cta agc aat gga gaa gtg atg agg ggc att ttc atc aaa cat gtt      671
Arg Leu Ser Asn Gly Glu Val Met Arg Gly Ile Phe Ile Lys His Val
            210             215             220

ctg gaa gat agt cca gct ggc aaa aat gga acc ttg aaa cct gga gat      719
Leu Glu Asp Ser Pro Ala Gly Lys Asn Gly Thr Leu Lys Pro Gly Asp
            225             230             235

aga atc gta gag gtg gat gga atg gac ctc aga gat gca agc cat gaa      767
Arg Ile Val Glu Val Asp Gly Met Asp Leu Arg Asp Ala Ser His Glu
240             245             250             255

caa gct gtg gaa gcc att cgg aaa gca ggc aac cct gta gtc ttt atg      815
Gln Ala Val Glu Ala Ile Arg Lys Ala Gly Asn Pro Val Val Phe Met
            260             265             270

gta tagagcttta ttacagacca agggcaccca gtcagtcaga gtcagag              865
Val
```

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<210> 81
<211> 965
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (3)...(965)

<400> 81
tt cct tct gtg cta ccc gat tca gct gga aag ggc tct gag tac ctg       47
   Pro Ser Val Leu Pro Asp Ser Ala Gly Lys Gly Ser Glu Tyr Leu
   1             5               10              15

ctt gaa cag agc tcc ctg gcc tgt aat gct gag tgt gtc atg ctt caa      95
Leu Glu Gln Ser Ser Leu Ala Cys Asn Ala Glu Cys Val Met Leu Gln
            20              25              30

aat gta tct aaa gaa tct ttt gaa agg act att aat ata gca aaa ggc     143
Asn Val Ser Lys Glu Ser Phe Glu Arg Thr Ile Asn Ile Ala Lys Gly
            35              40              45

aat tct agc cta gga atg aca gtt agt gct aat aaa gat ggc ttg ggg     191
Asn Ser Ser Leu Gly Met Thr Val Ser Ala Asn Lys Asp Gly Leu Gly
            50              55              60

atg atc gtt cga agc att att cat gga ggt gcc att agt cga gat ggc     239
Met Ile Val Arg Ser Ile Ile His Gly Gly Ala Ile Ser Arg Asp Gly
            65              70              75
```

```
cgg att gcc att ggg gac tgc atc ttg tcc att aat gaa gag tct acc        287
Arg Ile Ala Ile Gly Asp Cys Ile Leu Ser Ile Asn Glu Glu Ser Thr
 80                  85                  90                  95

atc agt gta acc aat gcc cag gca cga gct atg ttg aga aga cat tct        335
Ile Ser Val Thr Asn Ala Gln Ala Arg Ala Met Leu Arg Arg His Ser
                100                 105                 110

ctc att ggc cct gac ata aaa att act tat gtg cct gca gaa cat ttg        383
Leu Ile Gly Pro Asp Ile Lys Ile Thr Tyr Val Pro Ala Glu His Leu
            115                 120                 125

gaa gag ttc aaa ata agc ttg gga caa caa tct gga aga gta atg gca        431
Glu Glu Phe Lys Ile Ser Leu Gly Gln Gln Ser Gly Arg Val Met Ala
            130                 135                 140

ctg gat att ttt tct tca tac act ggc aga gac att cca gaa tta cca        479
Leu Asp Ile Phe Ser Ser Tyr Thr Gly Arg Asp Ile Pro Glu Leu Pro
            145                 150                 155

gag cga gaa gag gga gag ggt gaa gaa agc gaa ctt caa aac aca gca        527
Glu Arg Glu Glu Gly Glu Gly Glu Glu Ser Glu Leu Gln Asn Thr Ala
160                 165                 170                 175

tat agc aat tgg aat cag ccc agg cgg gtg gaa ctc tgg aga gaa cca        575
Tyr Ser Asn Trp Asn Gln Pro Arg Arg Val Glu Leu Trp Arg Glu Pro
                180                 185                 190

agc aaa tcc tta ggc atc agc att gtt ggt gga cga ggg atg ggg agt        623
Ser Lys Ser Leu Gly Ile Ser Ile Val Gly Gly Arg Gly Met Gly Ser
            195                 200                 205

cgg cta agc aat gga gaa gtg atg agg ggc att ttc atc aaa cat gtt        671
Arg Leu Ser Asn Gly Glu Val Met Arg Gly Ile Phe Ile Lys His Val
            210                 215                 220

ctg gaa gat agt cca gct ggc aaa aat gga acc ttg aaa cct gga gat        719
Leu Glu Asp Ser Pro Ala Gly Lys Asn Gly Thr Leu Lys Pro Gly Asp
            225                 230                 235

aga atc gta gag gtg gat gga atg gac ctc aga gat gca agc cat gaa        767
Arg Ile Val Glu Val Asp Gly Met Asp Leu Arg Asp Ala Ser His Glu
240                 245                 250                 255

caa gct gtg gaa gcc att cgg aaa gca ggc aac cct gta gtc ttt atg        815
Gln Ala Val Glu Ala Ile Arg Lys Ala Gly Asn Pro Val Val Phe Met
                260                 265                 270

gta cag agc att ata aac aga cca agg aaa tcc cct ttg cct tcc ttg        863
Val Gln Ser Ile Ile Asn Arg Pro Arg Lys Ser Pro Leu Pro Ser Leu
            275                 280                 285

ctg cac aac ctt tac cct aag tac aac ttc agc agc act aac cca ttt        911
Leu His Asn Leu Tyr Pro Lys Tyr Asn Phe Ser Ser Thr Asn Pro Phe
            290                 295                 300

gct gac tct cta caa atc aac gcc gac aag gca ccc agt cag tca gag        959
Ala Asp Ser Leu Gln Ile Asn Ala Asp Lys Ala Pro Ser Gln Ser Glu
            305                 310                 315
```

tca gag   965
Ser Glu
320

<210> 82
<211> 2000
<212> PRT
<213> Homo sapiens

<400> 82
Met Leu Glu Ala Ile Asp Lys Asn Arg Ala Leu His Ala Ala Glu Arg
 1   5   10   15
Leu Gln Thr Lys Leu Arg Glu Arg Gly Asp Val Ala Asn Glu Asp Lys
            20   25   30
Leu Ser Leu Leu Lys Ser Val Leu Gln Ser Pro Leu Phe Ser Gln Ile
        35   40   45
Leu Ser Leu Gln Thr Ser Val Gln Gln Leu Lys Asp Gln Val Asn Ile
    50   55   60
Ala Thr Ser Ala Thr Ser Asn Ile Glu Tyr Ala His Val Pro His Leu
65   70   75   80
Ser Pro Ala Val Ile Pro Thr Leu Gln Asn Glu Ser Phe Leu Leu Ser
                85   90   95
Pro Asn Asn Gly Asn Leu Glu Ala Leu Thr Gly Pro Gly Ile Pro His
            100   105   110
Ile Asn Gly Lys Pro Ala Cys Asp Glu Phe Asp Gln Leu Ile Lys Asn
        115   120   125
Met Ala Gln Gly Arg His Val Glu Val Phe Glu Leu Leu Lys Pro Pro
    130   135   140
Ser Gly Gly Leu Gly Phe Ser Val Val Gly Leu Arg Ser Glu Asn Arg
145   150   155   160
Gly Glu Leu Gly Ile Phe Val Gln Glu Ile Gln Glu Gly Ser Val Ala
                165   170   175
His Arg Asp Gly Arg Leu Lys Glu Thr Asp Gln Ile Leu Ala Ile Asn
            180   185   190
Gly Gln Ala Leu Asp Gln Thr Ile Thr His Gln Gln Ala Ile Ser Ile
        195   200   205
Leu Gln Lys Ala Lys Asp Thr Val Gln Leu Val Ile Ala Arg Gly Ser
    210   215   220
Leu Pro Gln Leu Val Ser Pro Ile Val Ser Arg Ser Pro Ser Ala Ala
225   230   235   240
Ser Thr Ile Ser Ala His Ser Asn Pro Val His Trp Gln His Met Glu
                245   250   255
Thr Ile Glu Leu Val Asn Asp Gly Ser Gly Leu Gly Phe Gly Ile Ile
            260   265   270
Gly Gly Lys Ala Thr Gly Val Ile Val Lys Thr Ile Leu Pro Gly Gly
        275   280   285
Val Ala Asp Gln His Gly Arg Leu Cys Ser Gly Asp His Ile Leu Lys
    290   295   300
Ile Gly Asp Thr Asp Leu Ala Gly Met Ser Ser Glu Gln Val Ala Gln
305   310   315   320
Val Leu Arg Gln Cys Gly Asn Arg Val Lys Leu Met Ile Ala Arg Ser
                325   330   335
Ala Ile Glu Glu Arg Thr Ala Pro Thr Ala Leu Gly Ile Thr Leu Ser
            340   345   350
Ser Ser Pro Thr Ser Thr Pro Glu Leu Arg Val Asp Ala Ser Thr Gln
        355   360   365
Lys Gly Glu Glu Ser Glu Thr Phe Asp Val Glu Leu Thr Lys Asn Val
    370   375   380
Gln Gly Leu Gly Ile Thr Ile Ala Gly Tyr Ile Gly Asp Lys Lys Leu
385   390   395   400
Glu Pro Ser Gly Ile Phe Val Lys Ser Ile Thr Lys Ser Ser Ala Val
                405   410   415

```
Glu His Asp Gly Arg Ile Gln Ile Gly Asp Gln Ile Ile Ala Val Asp
            420             425             430
Gly Thr Asn Leu Gln Gly Phe Thr Asn Gln Gln Ala Val Glu Val Leu
            435             440             445
Arg His Thr Gly Gln Thr Val Leu Leu Thr Leu Met Arg Arg Gly Met
    450             455             460
Lys Gln Glu Ala Glu Leu Met Ser Arg Glu Asp Val Thr Lys Asp Ala
465             470             475             480
Asp Leu Ser Pro Val Asn Ala Ser Ile Ile Lys Glu Asn Tyr Glu Lys
            485             490             495
Asp Glu Asp Phe Leu Ser Ser Thr Arg Asn Thr Asn Ile Leu Pro Thr
            500             505             510
Glu Glu Glu Gly Tyr Pro Leu Leu Ser Ala Glu Ile Glu Glu Ile Glu
            515             520             525
Asp Ala Gln Lys Gln Glu Ala Ala Leu Leu Thr Lys Trp Gln Arg Ile
    530             535             540
Met Gly Ile Asn Tyr Glu Ile Val Val Ala His Val Ser Lys Phe Ser
545             550             555             560
Glu Asn Ser Gly Leu Gly Ile Ser Leu Glu Ala Thr Val Gly His His
            565             570             575
Phe Ile Arg Ser Val Leu Pro Glu Gly Pro Val Gly His Ser Gly Lys
            580             585             590
Leu Phe Ser Gly Asp Glu Leu Leu Glu Val Asn Gly Ile Thr Leu Leu
            595             600             605
Gly Glu Asn His Gln Asp Val Val Asn Ile Leu Lys Glu Leu Pro Ile
    610             615             620
Glu Val Thr Met Val Cys Cys Arg Arg Thr Val Pro Pro Thr Thr Gln
625             630             635             640
Ser Glu Leu Asp Ser Leu Asp Leu Cys Asp Ile Glu Leu Thr Glu Lys
            645             650             655
Pro His Val Asp Leu Gly Glu Phe Ile Gly Ser Ser Glu Pro Glu Asp
            660             665             670
Pro Val Leu Ala Met Thr Asp Ala Gly Gln Ser Thr Glu Glu Val Gln
    675             680             685
Ala Pro Leu Ala Met Trp Glu Ala Gly Ile Gln His Ile Met Leu Glu
    690             695             700
Lys Gly Ser Lys Gly Leu Gly Phe Ser Ile Leu Asp Tyr Gln Asp Pro
705             710             715             720
Ile Asp Pro Ala Ser Thr Val Ile Ile Ile Arg Ser Leu Val Pro Gly
            725             730             735
Gly Ile Ala Glu Lys Asp Gly Arg Leu Leu Pro Gly Asp Arg Leu Met
            740             745             750
Phe Val Asn Asp Val Asn Leu Glu Asn Ser Ser Leu Glu Glu Ala Val
    755             760             765
Glu Ala Leu Lys Gly Ala Pro Ser Gly Thr Val Arg Ile Gly Val Ala
    770             775             780
Lys Pro Leu Pro Leu Ser Pro Glu Glu Gly Tyr Val Ser Ala Lys Glu
785             790             795             800
Asp Ser Phe Leu Tyr Pro Pro His Ser Cys Glu Glu Ala Gly Leu Ala
            805             810             815
Asp Lys Pro Leu Phe Arg Ala Asp Leu Ala Leu Val Gly Thr Asn Asp
    820             825             830
Ala Asp Leu Val Asp Glu Ser Thr Phe Glu Ser Pro Tyr Ser Pro Glu
    835             840             845
Asn Asp Ser Ile Tyr Ser Thr Gln Ala Ser Ile Leu Ser Leu His Gly
    850             855             860
Ser Ser Cys Gly Asp Gly Leu Asn Tyr Gly Ser Ser Leu Pro Ser Ser
865             870             875             880
Pro Pro Lys Asp Val Ile Glu Asn Ser Cys Asp Pro Val Leu Asp Leu
            885             890             895
His Met Ser Leu Glu Glu Leu Tyr Thr Gln Asn Leu Leu Glu Arg Gln
            900             905             910
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Asp Glu Asn Thr Pro Ser Val Asp Ile Ser Met Gly Pro Ala Ser Gly
    915   920   925

Phe Thr Ile Asn Asp Tyr Thr Pro Ala Asn Ala Ile Glu Gln Gln Tyr
    930   935   940

Glu Cys Glu Asn Thr Ile Val Trp Thr Glu Ser His Leu Pro Ser Glu
945   950   955   960

Val Ile Ser Ser Ala Glu Leu Pro Ser Val Leu Pro Asp Ser Ala Gly
            965   970   975

Lys Gly Ser Glu His Leu Leu Glu Gln Ser Ser Leu Ala Cys Asn Ala
        980   985   990

Glu Cys Val Met Leu Gln Asn Val Ser Lys Glu Ser Phe Glu Arg Thr
        995   1000   1005

Ile Asn Ile Ala Lys Gly Asn Ser Ser Leu Gly Met Thr Val Ser Ala
    1010   1015   1020

Asn Lys Asp Gly Leu Gly Met Ile Val Arg Ser Ile Ile His Gly Gly
1025   1030   1035   1040

Ala Ile Ser Arg Asp Gly Arg Ile Ala Ile Gly Asp Cys Ile Leu Ser
            1045   1050   1055

Ile Asn Glu Glu Ser Thr Ile Ser Val Thr Asn Ala Gln Ala Arg Ala
            1060   1065   1070

Met Leu Arg Arg His Ser Leu Ile Gly Pro Asp Ile Lys Ile Thr Tyr
            1075   1080   1085

Val Pro Ala Glu His Leu Glu Glu Phe Lys Ile Ser Leu Gly Gln Gln
            1090   1095   1100

Ser Gly Arg Val Met Ala Leu Asp Ile Phe Ser Ser Tyr Thr Gly Arg
1105   1110   1115   1120

Asp Ile Pro Glu Leu Pro Glu Arg Glu Glu Gly Glu Gly Glu Glu Ser
            1125   1130   1135

Glu Leu Gln Asn Thr Ala Tyr Ser Asn Trp Asn Gln Pro Arg Arg Val
            1140   1145   1150

Glu Leu Trp Arg Glu Pro Ser Lys Ser Leu Gly Ile Ser Ile Val Gly
            1155   1160   1165

Gly Arg Gly Met Gly Ser Arg Leu Ser Asn Gly Glu Val Met Arg Gly
    1170   1175   1180

Ile Phe Ile Lys His Val Leu Glu Asp Ser Pro Ala Gly Lys Asn Gly
1185   1190   1195   1200

Thr Leu Lys Pro Gly Asp Arg Ile Val Glu Ala Pro Ser Gln Ser Glu
            1205   1210   1215

Ser Glu Pro Glu Lys Ala Pro Leu Cys Ser Val Pro Pro Pro Pro Pro
            1220   1225   1230

Ser Ala Phe Ala Glu Met Gly Ser Asp His Thr Gln Ser Ser Ala Ser
          1235   1240   1245

Lys Ile Ser Gln Asp Val Asp Lys Glu Asp Glu Phe Gly Tyr Ser Trp
    1250   1255   1260

Lys Asn Ile Arg Glu Arg Tyr Gly Thr Leu Thr Gly Glu Leu His Met
1265   1270   1275   1280

Ile Glu Leu Glu Lys Gly His Ser Gly Leu Gly Leu Ser Leu Ala Gly
          1285   1290   1295

Asn Lys Asp Arg Ser Arg Met Ser Val Phe Ile Val Gly Ile Asp Pro
        1300   1305   1310

Asn Gly Ala Ala Gly Lys Asp Gly Arg Leu Gln Ile Ala Asp Glu Leu
        1315   1320   1325

Leu Glu Ile Asn Gly Gln Ile Leu Tyr Gly Arg Ser His Gln Asn Ala
    1330   1335   1340

Ser Ser Ile Ile Lys Cys Ala Pro Ser Lys Val Lys Ile Ile Phe Ile
1345   1350   1355   1360

Arg Asn Lys Asp Ala Val Asn Gln Met Ala Val Cys Pro Gly Asn Ala
          1365   1370   1375

Val Glu Pro Leu Pro Ser Asn Ser Glu Asn Leu Gln Asn Lys Glu Thr
          1380   1385   1390

Glu Pro Thr Val Thr Thr Ser Asp Ala Ala Val Asp Leu Ser Ser Phe
          1395   1400   1405

Lys Asn Val Gln His Leu Glu Leu Pro Lys Asp Gln Gly Gly Leu Gly
    1410   1415   1420

Ile Ala Ile Ser Glu Glu Asp Thr Leu Ser Gly Val Ile Ile Lys Ser
1425   1430   1435   1440

Leu Thr Glu His Gly Val Ala Ala Thr Asp Gly Arg Leu Lys Val Gly
                1445   1450   1455

Asp Gln Ile Leu Ala Val Asp Asp Glu Ile Val Val Gly Tyr Pro Ile
                1460   1465   1470

Glu Lys Phe Ile Ser Leu Leu Lys Thr Ala Lys Met Thr Val Lys Leu
    1475   1480   1485

Thr Ile His Ala Glu Asn Pro Asp Ser Gln Ala Val Pro Ser Ala Ala
    1490   1495   1500

Gly Ala Ala Ser Gly Glu Lys Lys Asn Ser Ser Gln Ser Leu Met Val
1505   1510   1515   1520

Pro Gln Ser Gly Ser Pro Glu Pro Glu Ser Ile Arg Asn Thr Ser Arg
                1525   1530   1535

Ser Ser Thr Pro Ala Ile Phe Ala Ser Asp Pro Ala Thr Cys Pro Ile
                1540   1545   1550

Ile Pro Gly Cys Glu Thr Thr Ile Glu Ile Ser Lys Gly Arg Thr Gly
                1555   1560   1565

Leu Gly Leu Ser Ile Val Gly Gly Ser Asp Thr Leu Leu Gly Ala Phe
    1570   1575   1580

Ile Ile His Glu Val Tyr Glu Glu Gly Ala Ala Cys Lys Asp Gly Arg
1585   1590   1595   1600

Leu Trp Ala Gly Asp Gln Ile Leu Glu Val Asn Gly Ile Asp Leu Arg
                1605   1610   1615

Lys Ala Thr His Asp Glu Ala Ile Asn Val Leu Arg Gln Thr Pro Gln
    1620   1625   1630

Arg Val Arg Leu Thr Leu Tyr Arg Asp Glu Ala Pro Tyr Lys Glu Glu
    1635   1640   1645

Glu Val Cys Asp Thr Leu Thr Ile Glu Leu Gln Lys Lys Pro Gly Lys
    1650   1655   1660

Gly Leu Gly Leu Ser Ile Val Gly Lys Arg Asn Asp Thr Gly Val Phe
1665   1670   1675   1680

Val Ser Asp Ile Val Lys Gly Gly Ile Ala Asp Pro Asp Gly Arg Leu
                1685   1690   1695

Ile Gln Gly Asp Gln Ile Leu Leu Val Asn Gly Glu Asp Val Arg Asn
                1700   1705   1710

Ala Ser Gln Glu Ala Val Ala Ala Leu Leu Lys Cys Ser Leu Gly Thr
    1715   1720   1725

Val Thr Leu Glu Val Gly Arg Ile Lys Ala Gly Pro Phe His Ser Glu
    1730   1735   1740

Arg Arg Pro Ser Gln Thr Ser Gln Val Ser Glu Gly Ser Leu Ser Ser
1745   1750   1755   1760

Phe Thr Phe Pro Leu Ser Gly Ser Ser Thr Ser Glu Ser Leu Glu Ser
                1765   1770   1775

Ser Ser Lys Lys Asn Ala Leu Ala Ser Glu Ile Gln Gly Leu Arg Thr
                1780   1785   1790

Val Glu Met Lys Lys Gly Pro Thr Asp Ser Leu Gly Ile Ser Ile Ala
    1795   1800   1805

Gly Gly Val Gly Ser Pro Leu Gly Asp Val Pro Ile Phe Ile Ala Met
1810   1815   1820

Met His Pro Thr Gly Val Ala Ala Gln Thr Gln Lys Leu Arg Val Gly
1825   1830   1835   1840

Asp Arg Ile Val Thr Ile Cys Gly Thr Ser Thr Glu Gly Met Thr His
                1845   1850   1855

Thr Gln Ala Val Asn Leu Leu Lys Asn Ala Ser Gly Ser Ile Glu Met
    1860   1865   1870

Gln Val Val Ala Gly Gly Asp Val Ser Val Val Thr Gly His His Gln
    1875   1880   1885

Glu Pro Ala Ser Ser Ser Leu Ser Phe Thr Gly Leu Thr Ser Thr Ser
    1890   1895   1900

```
Ile Phe Gln Asp Asp Leu Gly Pro Pro Gln Cys Lys Ser Ile Thr Leu
1905               1910               1915               1920
Glu Arg Gly Pro Asp Gly Leu Gly Phe Ser Ile Val Gly Gly Tyr Gly
              1925               1930               1935
Ser Pro His Gly Asp Leu Pro Ile Tyr Val Lys Thr Val Phe Ala Lys
              1940               1945               1950
Gly Ala Ala Ser Glu Asp Gly Arg Leu Lys Arg Gly Asp Gln Ile Ile
          1955               1960               1965
Ala Val Asn Gly Gln Ser Leu Glu Gly Val Thr His Glu Glu Ala Val
      1970               1975               1980
Ala Ile Leu Lys Arg Thr Lys Gly Thr Val Thr Leu Met Val Leu Ser
1985               1990               1995               2000


<210> 83
<211> 2070
<212> PRT
<213> Homo sapiens

<400> 83
Met Leu Glu Ala Ile Asp Lys Asn Arg Ala Leu His Ala Ala Glu Arg
1               5               10               15
Leu Gln Thr Lys Leu Arg Glu Arg Gly Asp Val Ala Asn Glu Asp Lys
          20               25               30
Leu Ser Leu Leu Lys Ser Val Leu Gln Ser Pro Leu Phe Ser Gln Ile
          35               40               45
Leu Ser Leu Gln Thr Ser Val Gln Gln Leu Lys Asp Gln Val Asn Ile
      50               55               60
Ala Thr Ser Ala Thr Ser Asn Ile Glu Tyr Ala His Val Pro His Leu
65               70               75               80
Ser Pro Ala Val Ile Pro Thr Leu Gln Asn Glu Ser Phe Leu Leu Ser
              85               90               95
Pro Asn Asn Gly Asn Leu Glu Ala Leu Thr Gly Pro Gly Ile Pro His
          100               105               110
Ile Asn Gly Lys Pro Ala Cys Asp Glu Phe Asp Gln Leu Ile Lys Asn
      115               120               125
Met Ala Gln Gly Arg His Val Glu Val Phe Glu Leu Leu Lys Pro Pro
130               135               140
Ser Gly Gly Leu Gly Phe Ser Val Val Gly Leu Arg Ser Glu Asn Arg
145               150               155               160
Gly Glu Leu Gly Ile Phe Val Gln Glu Ile Gln Glu Gly Ser Val Ala
              165               170               175
His Arg Asp Gly Arg Leu Lys Glu Thr Asp Gln Ile Leu Ala Ile Asn
          180               185               190
Gly Gln Ala Leu Asp Gln Thr Ile Thr His Gln Gln Ala Ile Ser Ile
      195               200               205
Leu Gln Lys Ala Lys Asp Thr Val Gln Leu Val Ile Ala Arg Gly Ser
      210               215               220
Leu Pro Gln Leu Val Ser Pro Ile Val Ser Arg Ser Pro Ser Ala Ala
225               230               235               240
Ser Thr Ile Ser Ala His Ser Asn Pro Val His Trp Gln His Met Glu
              245               250               255
Thr Ile Glu Leu Val Asn Asp Gly Ser Gly Leu Gly Phe Gly Ile Ile
          260               265               270
Gly Gly Lys Ala Thr Gly Val Ile Val Lys Thr Ile Leu Pro Gly Gly
          275               280               285
Val Ala Asp Gln His Gly Arg Leu Cys Ser Gly Asp His Ile Leu Lys
      290               295               300
Ile Gly Asp Thr Asp Leu Ala Gly Met Ser Ser Glu Gln Val Ala Gln
305               310               315               320
Val Leu Arg Gln Cys Gly Asn Arg Val Lys Leu Met Ile Ala Arg Ser
              325               330               335
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Ala Ile Glu Glu Arg Thr Ala Pro Thr Ala Leu Gly Ile Thr Leu Ser
        340             345               350
Ser Ser Pro Thr Ser Thr Pro Glu Leu Arg Val Asp Ala Ser Thr Gln
        355             360               365
Lys Gly Glu Glu Ser Glu Thr Phe Asp Val Glu Leu Thr Lys Asn Val
    370             375               380
Gln Gly Leu Gly Ile Thr Ile Ala Gly Tyr Ile Gly Asp Lys Lys Leu
385             390               395               400
Glu Pro Ser Gly Ile Phe Val Lys Ser Ile Thr Lys Ser Ser Ala Val
                405             410               415
Glu His Asp Gly Arg Ile Gln Ile Gly Asp Gln Ile Ile Ala Val Asp
            420             425               430
Gly Thr Asn Leu Gln Gly Phe Thr Asn Gln Gln Ala Val Glu Val Leu
        435             440               445
Arg His Thr Gly Gln Thr Val Leu Leu Thr Leu Met Arg Arg Gly Met
    450             455               460
Lys Gln Glu Ala Glu Leu Met Ser Arg Glu Asp Val Thr Lys Asp Ala
465             470               475               480
Asp Leu Ser Pro Val Asn Ala Ser Ile Ile Lys Glu Asn Tyr Glu Lys
            485             490               495
Asp Glu Asp Phe Leu Ser Ser Thr Arg Asn Thr Asn Ile Leu Pro Thr
            500             505               510
Glu Glu Glu Gly Tyr Pro Leu Leu Ser Ala Glu Ile Glu Glu Ile Glu
        515             520               525
Asp Ala Gln Lys Gln Glu Ala Ala Leu Leu Thr Lys Trp Gln Arg Ile
    530             535               540
Met Gly Ile Asn Tyr Glu Ile Val Val Ala His Val Ser Lys Phe Ser
545             550               555               560
Glu Asn Ser Gly Leu Gly Ile Ser Leu Glu Ala Thr Val Gly His His
            565             570               575
Phe Ile Arg Ser Val Leu Pro Glu Gly Pro Val Gly His Ser Gly Lys
        580             585               590
Leu Phe Ser Gly Asp Glu Leu Leu Glu Val Asn Gly Ile Thr Leu Leu
    595             600               605
Gly Glu Asn His Gln Asp Val Val Asn Ile Leu Lys Glu Leu Pro Ile
    610             615               620
Glu Val Thr Met Val Cys Cys Arg Arg Thr Val Pro Pro Thr Thr Gln
625             630               635               640
Ser Glu Leu Asp Ser Leu Asp Leu Cys Asp Ile Glu Leu Thr Glu Lys
            645             650               655
Pro His Val Asp Leu Gly Glu Phe Ile Gly Ser Ser Glu Pro Glu Asp
            660             665               670
Pro Val Leu Ala Met Thr Asp Ala Gly Gln Ser Thr Glu Glu Val Gln
    675             680               685
Ala Pro Leu Ala Met Trp Glu Ala Gly Ile Gln His Ile Met Leu Glu
    690             695               700
Lys Gly Ser Lys Gly Leu Gly Phe Ser Ile Leu Asp Tyr Gln Asp Pro
705             710               715               720
Ile Asp Pro Ala Ser Thr Val Ile Ile Ile Arg Ser Leu Val Pro Gly
            725             730               735
Gly Ile Ala Glu Lys Asp Gly Arg Leu Leu Pro Gly Asp Arg Leu Met
        740             745               750
Phe Val Asn Asp Val Asn Leu Glu Asn Ser Ser Leu Glu Glu Ala Val
    755             760               765
Glu Ala Leu Lys Gly Ala Pro Ser Gly Thr Val Arg Ile Gly Val Ala
    770             775               780
Lys Pro Leu Pro Leu Ser Pro Glu Glu Gly Tyr Val Ser Ala Lys Glu
785             790               795               800
Asp Ser Phe Leu Tyr Pro Pro His Ser Cys Glu Glu Ala Gly Leu Ala
            805             810               815
Asp Lys Pro Leu Phe Arg Ala Asp Leu Ala Leu Val Gly Thr Asn Asp
    820             825               830
```

Ala Asp Leu Val Asp Glu Ser Thr Phe Glu Ser Pro Tyr Ser Pro Glu
        835   840   845
Asn Asp Ser Ile Tyr Ser Thr Gln Ala Ser Ile Leu Ser Leu His Gly
        850   855   860
Ser Ser Cys Gly Asp Gly Leu Asn Tyr Gly Ser Ser Leu Pro Ser Ser
865   870   875   880
Pro Pro Lys Asp Val Ile Glu Asn Ser Cys Asp Pro Val Leu Asp Leu
                885   890   895
His Met Ser Leu Glu Glu Leu Tyr Thr Gln Asn Leu Leu Glu Arg Gln
        900   905   910
Asp Glu Asn Thr Pro Ser Val Asp Ile Ser Met Gly Pro Ala Ser Gly
        915   920   925
Phe Thr Ile Asn Asp Tyr Thr Pro Ala Asn Ala Ile Glu Gln Gln Tyr
        930   935   940
Glu Cys Glu Asn Thr Ile Val Trp Thr Glu Ser His Leu Pro Ser Glu
945   950   955   960
Val Ile Ser Ser Ala Glu Leu Pro Ser Val Leu Pro Asp Ser Ala Gly
                965   970   975
Lys Gly Ser Glu Tyr Leu Leu Glu Gln Ser Ser Leu Ala Cys Asn Ala
        980   985   990
Glu Cys Val Met Leu Gln Asn Val Ser Lys Glu Ser Phe Glu Arg Thr
        995   1000   1005
Ile Asn Ile Ala Lys Gly Asn Ser Ser Leu Gly Met Thr Val Ser Ala
        1010   1015   1020
Asn Lys Asp Gly Leu Gly Met Ile Val Arg Ser Ile Ile His Gly Gly
1025   1030   1035   1040
Ala Ile Ser Arg Asp Gly Arg Ile Ala Ile Gly Asp Cys Ile Leu Ser
                1045   1050   1055
Ile Asn Glu Glu Ser Thr Ile Ser Val Thr Asn Ala Gln Ala Arg Ala
        1060   1065   1070
Met Leu Arg Arg His Ser Leu Ile Gly Pro Asp Ile Lys Ile Thr Tyr
        1075   1080   1085
Val Pro Ala Glu His Leu Glu Glu Phe Lys Ile Ser Leu Gly Gln Gln
        1090   1095   1100
Ser Gly Arg Val Met Ala Leu Asp Ile Phe Ser Ser Tyr Thr Gly Arg
1105   1110   1115   1120
Asp Ile Pro Glu Leu Pro Glu Arg Glu Glu Gly Glu Gly Glu Glu Ser
                1125   1130   1135
Glu Leu Gln Asn Thr Ala Tyr Ser Asn Trp Asn Gln Pro Arg Arg Val
        1140   1145   1150
Glu Leu Trp Arg Glu Pro Ser Lys Ser Leu Gly Ile Ser Ile Val Gly
        1155   1160   1165
Gly Arg Gly Met Gly Ser Arg Leu Ser Asn Gly Glu Val Met Arg Gly
        1170   1175   1180
Ile Phe Ile Lys His Val Leu Glu Asp Arg Pro Ala Gly Lys Asn Gly
1185   1190   1195   1200
Thr Leu Lys Pro Gly Asp Arg Ile Val Glu Val Asp Gly Met Asp Leu
                1205   1210   1215
Arg Asp Ala Ser His Glu Gln Ala Val Glu Ala Ile Arg Lys Ala Gly
        1220   1225   1230
Asn Pro Val Val Phe Met Val Gln Ser Ile Ile Asn Arg Pro Arg Lys
        1235   1240   1245
Ser Pro Leu Pro Ser Leu Leu His Asn Leu Tyr Pro Lys Tyr Asn Phe
        1250   1255   1260
Ser Ser Thr Asn Pro Phe Ala Asp Ser Leu Gln Ile Asn Ala Asp Lys
1265   1270   1275   1280
Ala Pro Ser Gln Ser Glu Ser Glu Pro Gly Lys Ala Pro Leu Cys Ser
                1285   1290   1295
Val Pro Pro Pro Pro Ser Ala Phe Ala Glu Met Gly Ser Asp His
        1300   1305   1310
Thr Gln Ser Ser Ala Ser Lys Ile Ser Gln Asp Val Asp Lys Glu Asp
        1315   1320   1325

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Glu Phe Gly Tyr Ser Trp Lys Asn Ile Arg Glu Arg Tyr Gly Thr Leu
    1330                1335                1340
Thr Gly Glu Leu His Met Ile Glu Leu Glu Lys Gly His Ser Gly Leu
1345                1350                1355                1360
Gly Leu Ser Leu Ala Gly Asn Lys Asp Arg Ser Arg Met Ser Val Phe
                1365                1370                1375
Ile Val Gly Ile Asp Pro Asn Gly Ala Ala Gly Lys Asp Gly Arg Leu
                1380                1385                1390
Gln Ile Ala Asp Glu Leu Leu Glu Ile Asn Gly Gln Ile Leu Tyr Gly
        1395                1400                1405
Arg Ser His Gln Asn Ala Ser Ser Ile Ile Lys Cys Ala Pro Ser Lys
        1410                1415                1420
Val Lys Ile Ile Phe Ile Arg Asn Lys Asp Ala Val Asn Gln Met Ala
1425                1430                1435                1440
Val Cys Pro Gly Asn Ala Val Glu Pro Leu Pro Ser Asn Ser Glu Asn
                1445                1450                1455
Leu Gln Asn Lys Glu Thr Glu Pro Thr Val Thr Thr Ser Asp Ala Ala
                1460                1465                1470
Val Asp Leu Ser Ser Phe Lys Asn Val Gln His Leu Glu Leu Pro Lys
        1475                1480                1485
Asp Gln Gly Gly Leu Gly Ile Ala Ile Ser Glu Glu Asp Thr Leu Ser
        1490                1495                1500
Gly Val Ile Ile Lys Ser Leu Thr Glu His Gly Val Ala Ala Thr Asp
1505                1510                1515                1520
Gly Arg Leu Lys Val Gly Asp Gln Ile Leu Ala Val Asp Asp Glu Ile
                1525                1530                1535
Val Val Gly Tyr Pro Ile Glu Lys Phe Ile Ser Leu Leu Lys Thr Ala
                1540                1545                1550
Lys Met Thr Val Lys Leu Thr Ile His Ala Glu Asn Pro Asp Ser Gln
        1555                1560                1565
Ala Val Pro Ser Ala Ala Gly Ala Ala Ser Gly Glu Lys Lys Asn Ser
        1570                1575                1580
Ser Gln Ser Leu Met Val Pro Gln Ser Gly Ser Pro Glu Pro Glu Ser
1585                1590                1595                1600
Ile Arg Asn Thr Ser Arg Ser Ser Thr Pro Ala Ile Phe Ala Ser Asp
                1605                1610                1615
Pro Ala Thr Cys Pro Ile Ile Pro Gly Cys Glu Thr Thr Ile Glu Ile
                1620                1625                1630
Ser Lys Gly Arg Thr Gly Leu Gly Leu Ser Ile Val Gly Gly Ser Asp
        1635                1640                1645
Thr Leu Leu Gly Ala Phe Ile Ile His Glu Val Tyr Glu Glu Gly Ala
1650                1655                1660
Ala Cys Lys Asp Gly Arg Leu Trp Ala Gly Asp Gln Ile Leu Glu Val
1665                1670                1675                1680
Asn Gly Ile Asp Leu Arg Lys Ala Thr His Asp Glu Ala Ile Asn Val
                1685                1690                1695
Leu Arg Gln Thr Pro Gln Arg Val Arg Leu Thr Leu Tyr Arg Asp Glu
        1700                1705                1710
Ala Pro Tyr Lys Glu Glu Glu Val Cys Asp Thr Leu Thr Ile Glu Leu
        1715                1720                1725
Gln Lys Lys Pro Gly Lys Gly Leu Gly Leu Ser Ile Val Gly Lys Arg
        1730                1735                1740
Asn Asp Thr Gly Val Phe Val Ser Asp Ile Val Lys Gly Gly Ile Ala
1745                1750                1755                1760
Asp Pro Asp Gly Arg Leu Ile Gln Gly Asp Gln Ile Leu Leu Val Asn
                1765                1770                1775
Gly Glu Asp Val Arg Asn Ala Ser Gln Glu Ala Val Ala Ala Leu Leu
        1780                1785                1790
Lys Cys Ser Leu Gly Thr Val Thr Leu Glu Val Gly Arg Ile Lys Ala
        1795                1800                1805
Gly Pro Phe His Ser Glu Arg Arg Pro Ser Gln Thr Ser Gln Val Ser
        1810                1815                1820
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Glu Gly Ser Leu Ser Ser Phe Thr Phe Pro Leu Ser Gly Ser Ser Thr
1825                1830            1835                    1840
Ser Glu Ser Leu Glu Ser Ser Ser Lys Lys Asn Ala Leu Ala Ser Glu
                1845            1850                    1855
Ile Gln Gly Leu Arg Thr Val Glu Met Lys Lys Gly Pro Thr Asp Ser
                1860            1865                1870
Leu Gly Ile Ser Ile Ala Gly Gly Val Gly Ser Pro Leu Gly Asp Val
            1875            1880                1885
Pro Ile Phe Ile Ala Met Met His Pro Thr Gly Val Ala Ala Gln Thr
        1890            1895                1900
Gln Lys Leu Arg Val Gly Asp Arg Ile Val Thr Ile Cys Gly Thr Ser
1905                1910                1915                    1920
Thr Glu Gly Met Thr His Thr Gln Ala Val Asn Leu Leu Lys Asn Ala
                1925            1930                    1935
Ser Gly Ser Ile Glu Met Gln Val Val Ala Gly Gly Asp Val Ser Val
                1940            1945                1950
Val Thr Gly His His Gln Glu Pro Ala Ser Ser Ser Leu Ser Phe Thr
        1955            1960                1965
Gly Leu Thr Ser Thr Ser Ile Phe Gln Asp Asp Leu Gly Pro Pro Gln
        1970            1975                1980
Cys Lys Ser Ile Thr Leu Glu Arg Gly Pro Asp Gly Leu Gly Phe Ser
1985                1990            1995                    2000
Ile Val Gly Gly Tyr Gly Ser Pro His Gly Asp Leu Pro Ile Tyr Val
                2005            2010                2015
Lys Thr Val Phe Ala Lys Gly Ala Ala Ser Glu Asp Gly Arg Leu Lys
                2020            2025                2030
Arg Gly Asp Gln Ile Ile Ala Val Asn Gly Gln Ser Leu Glu Gly Val
                2035            2040                2045
Thr His Glu Glu Ala Val Ala Ile Leu Lys Arg Thr Lys Gly Thr Val
2050                2055                2060
Thr Leu Met Val Leu Ser
2065                2070
```

<210> 84
<211> 1239
<212> PRT
<213> Homo sapiens

<400> 84
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Met Leu Glu Ala Ile Asp Lys Asn Arg Ala Leu His Ala Ala Glu Arg
 1               5                10                      15
Leu Gln Thr Lys Leu Arg Glu Arg Gly Asp Val Ala Asn Glu Asp Lys
                20              25                  30
Leu Ser Leu Leu Lys Ser Val Leu Gln Ser Pro Leu Phe Ser Gln Ile
            35              40                  45
Leu Ser Leu Gln Thr Ser Val Gln Gln Leu Lys Asp Gln Val Asn Ile
        50              55                  60
Ala Thr Ser Ala Thr Ser Asn Ile Glu Tyr Ala His Val Pro His Leu
65              70                  75                      80
Ser Pro Ala Val Ile Pro Thr Leu Gln Asn Glu Ser Phe Leu Leu Ser
                85              90                  95
Pro Asn Asn Gly Asn Leu Glu Ala Leu Thr Gly Pro Gly Ile Pro His
            100             105                 110
Ile Asn Gly Lys Pro Ala Cys Asp Glu Phe Asp Gln Leu Ile Lys Asn
        115             120                 125
Met Ala Gln Gly Arg His Val Glu Val Phe Glu Leu Leu Lys Pro Pro
    130             135                 140
Ser Gly Gly Leu Gly Phe Ser Val Val Gly Leu Arg Ser Glu Asn Arg
145             150                 155                     160
Gly Glu Leu Gly Ile Phe Val Gln Glu Ile Gln Glu Gly Ser Val Ala
            165                 170                 175
```

His Arg Asp Gly Arg Leu Lys Glu Thr Asp Gln Ile Leu Ala Ile Asn
            180   185   190
Gly Gln Ala Leu Asp Gln Thr Ile Thr His Gln Gln Ala Ile Ser Ile
            195   200   205
Leu Gln Lys Ala Lys Asp Thr Val Gln Leu Val Ile Ala Arg Gly Ser
        210   215   220
Leu Pro Gln Leu Val Ser Pro Ile Val Ser Arg Ser Pro Ser Ala Ala
225   230   235   240
Ser Thr Ile Ser Ala His Ser Asn Pro Val His Trp Gln His Met Glu
                245   250   255
Thr Ile Glu Leu Val Asn Asp Gly Ser Gly Leu Gly Phe Gly Ile Ile
            260   265   270
Gly Gly Lys Ala Thr Gly Val Ile Val Lys Thr Ile Leu Pro Gly Gly
            275   280   285
Val Ala Asp Gln His Gly Arg Leu Cys Ser Gly Asp His Ile Leu Lys
        290   295   300
Ile Gly Asp Thr Asp Leu Ala Gly Met Ser Ser Glu Gln Val Ala Gln
305   310   315   320
Val Leu Arg Gln Cys Gly Asn Arg Val Lys Leu Met Ile Ala Arg Ser
                325   330   335
Ala Ile Glu Glu Arg Thr Ala Pro Thr Ala Leu Gly Ile Thr Leu Ser
            340   345   350
Ser Ser Pro Thr Ser Thr Pro Glu Leu Arg Val Asp Ala Ser Thr Gln
            355   360   365
Lys Gly Glu Glu Ser Glu Thr Phe Asp Val Glu Leu Thr Lys Asn Val
        370   375   380
Gln Gly Leu Gly Ile Thr Ile Ala Gly Tyr Ile Gly Asp Lys Lys Leu
385   390   395   400
Glu Pro Ser Gly Ile Phe Val Lys Ser Ile Thr Lys Ser Ser Ala Val
                405   410   415
Glu His Asp Gly Arg Ile Gln Ile Gly Asp Gln Ile Ile Ala Val Asp
            420   425   430
Gly Thr Asn Leu Gln Gly Phe Thr Asn Gln Gln Ala Val Glu Val Leu
            435   440   445
Arg His Thr Gly Gln Thr Val Leu Leu Thr Leu Met Arg Arg Gly Met
        450   455   460
Lys Gln Glu Ala Glu Leu Met Ser Arg Glu Asp Val Thr Lys Asp Ala
465   470   475   480
Asp Leu Ser Pro Val Asn Ala Ser Ile Ile Lys Glu Asn Tyr Glu Lys
                485   490   495
Asp Glu Asp Phe Leu Ser Ser Thr Arg Asn Thr Asn Ile Leu Pro Thr
            500   505   510
Glu Glu Glu Gly Tyr Pro Leu Leu Ser Ala Glu Ile Glu Glu Ile Glu
            515   520   525
Asp Ala Gln Lys Gln Glu Ala Ala Leu Leu Thr Lys Trp Gln Arg Ile
        530   535   540
Met Gly Ile Asn Tyr Glu Ile Val Val Ala His Val Ser Lys Phe Ser
545   550   555   560
Glu Asn Ser Gly Leu Gly Ile Ser Leu Glu Ala Thr Val Gly His His
                565   570   575
Phe Ile Arg Ser Val Leu Pro Glu Gly Pro Val Gly His Ser Gly Lys
            580   585   590
Leu Phe Ser Gly Asp Glu Leu Leu Glu Val Asn Gly Ile Thr Leu Leu
            595   600   605
Gly Glu Asn His Gln Asp Val Val Asn Ile Leu Lys Glu Leu Pro Ile
        610   615   620
Glu Val Thr Met Val Cys Cys Arg Arg Thr Val Pro Pro Thr Thr Gln
625   630   635   640
Ser Glu Leu Asp Ser Leu Asp Leu Cys Asp Ile Glu Leu Thr Glu Lys
                645   650   655
Pro His Val Asp Leu Gly Glu Phe Ile Gly Ser Ser Glu Pro Glu Asp
            660   665   670

Pro Val Leu Ala Met Thr Asp Ala Gly Gln Ser Thr Glu Glu Val Gln
        675   680   685

Ala Pro Leu Ala Met Trp Glu Ala Gly Ile Gln His Ile Met Leu Glu
        690   695   700

Lys Gly Ser Lys Gly Leu Gly Phe Ser Ile Leu Asp Tyr Gln Asp Pro
705   710   715   720

Ile Asp Pro Ala Ser Thr Val Ile Ile Ile Arg Ser Leu Val Pro Gly
                725   730   735

Gly Ile Ala Glu Lys Asp Gly Arg Leu Leu Pro Gly Asp Arg Leu Met
            740   745   750

Phe Val Asn Asp Val Asn Leu Glu Asn Ser Ser Leu Glu Glu Ala Val
        755   760   765

Glu Ala Leu Lys Gly Ala Pro Ser Gly Thr Val Arg Ile Gly Val Ala
    770   775   780

Lys Pro Leu Pro Leu Ser Pro Glu Glu Gly Tyr Val Ser Ala Lys Glu
785   790   795   800

Asp Ser Phe Leu Tyr Pro Pro His Ser Cys Glu Glu Ala Gly Leu Ala
            805   810   815

Asp Lys Pro Leu Phe Arg Ala Asp Leu Ala Leu Val Gly Thr Asn Asp
            820   825   830

Ala Asp Leu Val Asp Glu Ser Thr Phe Glu Ser Pro Tyr Ser Pro Glu
        835   840   845

Asn Asp Ser Ile Tyr Ser Thr Gln Ala Ser Ile Leu Ser Leu His Gly
    850   855   860

Ser Ser Cys Gly Asp Gly Leu Asn Tyr Gly Ser Ser Leu Pro Ser Ser
865   870   875   880

Pro Pro Lys Asp Val Ile Glu Asn Ser Cys Asp Pro Val Leu Asp Leu
            885   890   895

His Met Ser Leu Glu Glu Leu Tyr Thr Gln Asn Leu Leu Glu Arg Gln
        900   905   910

Asp Glu Asn Thr Pro Ser Val Asp Ile Ser Met Gly Pro Ala Ser Gly
    915   920   925

Phe Thr Ile Asn Asp Tyr Thr Pro Ala Asn Ala Ile Glu Gln Gln Tyr
    930   935   940

Glu Cys Glu Asn Thr Ile Val Trp Thr Glu Ser His Leu Pro Ser Glu
945   950   955   960

Val Ile Ser Ser Ala Glu Leu Pro Ser Val Leu Pro Asp Ser Ala Gly
            965   970   975

Lys Gly Ser Glu His Leu Leu Glu Gln Ser Ser Leu Ala Cys Asn Ala
        980   985   990

Glu Cys Val Met Leu Gln Asn Val Ser Lys Glu Ser Phe Glu Arg Thr
        995   1000   1005

Ile Asn Ile Ala Lys Gly Asn Ser Ser Leu Gly Met Thr Val Ser Ala
    1010   1015   1020

Asn Lys Asp Gly Leu Gly Met Ile Val Arg Ser Ile Ile His Gly Gly
1025   1030   1035   1040

Ala Ile Ser Arg Asp Gly Arg Ile Ala Ile Gly Asp Cys Ile Leu Ser
                1045   1050   1055

Ile Asn Glu Glu Ser Thr Ile Ser Val Thr Asn Ala Gln Ala Arg Ala
        1060   1065   1070

Met Leu Arg Arg His Ser Leu Ile Gly Pro Asp Ile Lys Ile Thr Tyr
        1075   1080   1085

Val Pro Ala Glu His Leu Glu Glu Phe Lys Ile Ser Leu Gly Gln Gln
    1090   1095   1100

Ser Gly Arg Val Met Ala Leu Asp Ile Phe Ser Ser Tyr Thr Gly Arg
1105   1110   1115   1120

Asp Ile Pro Glu Leu Pro Glu Arg Glu Glu Gly Glu Gly Glu Glu Ser
                1125   1130   1135

Glu Leu Gln Asn Thr Ala Tyr Ser Asn Trp Asn Gln Pro Arg Arg Val
        1140   1145   1150

Glu Leu Trp Arg Glu Pro Ser Lys Ser Leu Gly Ile Ser Ile Val Gly
        1155   1160   1165

```
Gly Arg Gly Met Gly Ser Arg Leu Ser Asn Gly Glu Val Met Arg Gly
    1170                1175                1180
Ile Phe Ile Lys His Val Leu Glu Asp Ser Pro Ala Gly Lys Asn Gly
1185                1190                1195                1200
Thr Leu Lys Pro Gly Asp Arg Ile Val Glu Val Asp Gly Met Asp Leu
                1205                1210                1215
Arg Asp Ala Ser His Glu Gln Ala Val Glu Ala Ile Arg Lys Ala Gly
                1220                1225                1230
Asn Pro Val Val Phe Met Val
        1235


<210> 85
<211> 6540
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (71)...(6070)

<400> 85
ttctcagtca cgcagttcca ttttaattgc tgttaatcat ttcagagaag aacactgaac      60
tttgaaaaaa atg ttg gaa gcc att gac aaa aat cgg gcc ctg cat gca         109
            Met Leu Glu Ala Ile Asp Lys Asn Arg Ala Leu His Ala
             1               5                  10

gca gag cgc ttg caa acc aag ctg cga gaa cgt ggg gat gta gca aat       157
Ala Glu Arg Leu Gln Thr Lys Leu Arg Glu Arg Gly Asp Val Ala Asn
     15              20                  25

gaa gac aaa ctg agc ctt ctg aag tca gtc ctg cag agc cct ctc ttc       205
Glu Asp Lys Leu Ser Leu Leu Lys Ser Val Leu Gln Ser Pro Leu Phe
 30              35                  40                  45

agt cag att ctg agc ctt cag act tct gta cag cag ctg aaa gac cag       253
Ser Gln Ile Leu Ser Leu Gln Thr Ser Val Gln Gln Leu Lys Asp Gln
                50                  55                  60

gta aat att gca act tca gca act tca aat att gaa tat gcc cac gtt       301
Val Asn Ile Ala Thr Ser Ala Thr Ser Asn Ile Glu Tyr Ala His Val
                65                  70                  75

cct cat ctc agc cca gct gtg att cct act ctg caa aat gaa tcg ttt       349
Pro His Leu Ser Pro Ala Val Ile Pro Thr Leu Gln Asn Glu Ser Phe
             80                  85                  90

tta tta tcc cca aac aat ggg aat ctg gaa gca ctt aca gga cct ggt       397
Leu Leu Ser Pro Asn Asn Gly Asn Leu Glu Ala Leu Thr Gly Pro Gly
         95                 100                 105

att cca cac att aat ggg aaa cct gct tgt gat gaa ttt gat cag ctt       445
Ile Pro His Ile Asn Gly Lys Pro Ala Cys Asp Glu Phe Asp Gln Leu
110                 115                 120                 125

atc aaa aat atg gcc cag ggt cgc cat gta gaa gtt ttt gag ctc ctc       493
Ile Lys Asn Met Ala Gln Gly Arg His Val Glu Val Phe Glu Leu Leu
                130                 135                 140

aaa cct cca tct gga ggc ctt ggg ttt agt gtt gtg gga cta aga agt       541
Lys Pro Pro Ser Gly Gly Leu Gly Phe Ser Val Val Gly Leu Arg Ser
                145                 150                 155
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gaa aac aga gga gag ctg gga ata ttt gtt caa gag ata caa gag ggc      589
Glu Asn Arg Gly Glu Leu Gly Ile Phe Val Gln Glu Ile Gln Glu Gly
        160                 165                 170

agt gtg gcc cat aga gat gga aga ttg aaa gaa act gat caa att ctt      637
Ser Val Ala His Arg Asp Gly Arg Leu Lys Glu Thr Asp Gln Ile Leu
        175                 180                 185

gct atc aat gga cag gct ctt gat cag aca att aca cat cag cag gct      685
Ala Ile Asn Gly Gln Ala Leu Asp Gln Thr Ile Thr His Gln Gln Ala
190                 195                 200                 205

atc agc atc ctg cag aaa gcc aaa gat act gtc cag cta gtt att gcc      733
Ile Ser Ile Leu Gln Lys Ala Lys Asp Thr Val Gln Leu Val Ile Ala
                210                 215                 220

aga ggc tca ttg cct cag ctt gtc agc ccc ata gtt tcc cgt tct cca      781
Arg Gly Ser Leu Pro Gln Leu Val Ser Pro Ile Val Ser Arg Ser Pro
                225                 230                 235

tct gca gcc agc aca att tca gct cac tct aat ccg gtt cac tgg caa      829
Ser Ala Ala Ser Thr Ile Ser Ala His Ser Asn Pro Val His Trp Gln
                240                 245                 250

cac atg gaa acg att gaa ttg gtg aat gat gga tct ggt ttg gga ttt      877
His Met Glu Thr Ile Glu Leu Val Asn Asp Gly Ser Gly Leu Gly Phe
        255                 260                 265

ggc atc ata gga gga aaa gca act ggt gtg ata gta aaa acc att ctg      925
Gly Ile Ile Gly Gly Lys Ala Thr Gly Val Ile Val Lys Thr Ile Leu
270                 275                 280                 285

cct gga gga gta gct gat cag cat ggg cgt tta tgc agt gga gac cac      973
Pro Gly Gly Val Ala Asp Gln His Gly Arg Leu Cys Ser Gly Asp His
                290                 295                 300

att cta aag att ggt gac aca gat cta gca gga atg agc agt gag caa     1021
Ile Leu Lys Ile Gly Asp Thr Asp Leu Ala Gly Met Ser Ser Glu Gln
                305                 310                 315

gta gca caa gtc ctt agg caa tgt gga aat aga gtt aag ttg atg att     1069
Val Ala Gln Val Leu Arg Gln Cys Gly Asn Arg Val Lys Leu Met Ile
        320                 325                 330

gca aga agt gcc ata gaa gaa cgt aca gca ccc act gct ttg ggc atc     1117
Ala Arg Ser Ala Ile Glu Glu Arg Thr Ala Pro Thr Ala Leu Gly Ile
        335                 340                 345

acc ctc tcc tca tcc cca act tca acg cca gag ttg cgg gtt gat gct     1165
Thr Leu Ser Ser Ser Pro Thr Ser Thr Pro Glu Leu Arg Val Asp Ala
350                 355                 360                 365

tct act cag aaa ggt gaa gaa agt gag aca ttt gat gta gaa ctc act     1213
Ser Thr Gln Lys Gly Glu Glu Ser Glu Thr Phe Asp Val Glu Leu Thr
                370                 375                 380

aaa aat gtc caa gga tta gga att acc att gct ggc tac att gga gat     1261
Lys Asn Val Gln Gly Leu Gly Ile Thr Ile Ala Gly Tyr Ile Gly Asp
                385                 390                 395
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aaa aaa ttg gaa cct tca gga atc ttt gta aag agc att aca aaa agc       1309
Lys Lys Leu Glu Pro Ser Gly Ile Phe Val Lys Ser Ile Thr Lys Ser
        400             405             410

agt gcc gtt gag cat gat gga aga atc caa att gga gac caa att ata       1357
Ser Ala Val Glu His Asp Gly Arg Ile Gln Ile Gly Asp Gln Ile Ile
        415             420             425

gca gta gat ggc aca aac ctt cag ggt ttt act aat cag caa gca gta       1405
Ala Val Asp Gly Thr Asn Leu Gln Gly Phe Thr Asn Gln Gln Ala Val
430             435             440             445

gag gta ttg cga cat aca gga caa act gtg ctc ctg aca cta atg agg       1453
Glu Val Leu Arg His Thr Gly Gln Thr Val Leu Leu Thr Leu Met Arg
            450             455             460

aga gga atg aag cag gaa gcc gag ctc atg tca agg gaa gac gtc aca       1501
Arg Gly Met Lys Gln Glu Ala Glu Leu Met Ser Arg Glu Asp Val Thr
        465             470             475

aaa gat gca gat ttg tct cct gtt aat gcc agc ata atc aaa gaa aat       1549
Lys Asp Ala Asp Leu Ser Pro Val Asn Ala Ser Ile Ile Lys Glu Asn
        480             485             490

tat gaa aaa gat gaa gat ttt tta tct tcg acg aga aac acc aac ata       1597
Tyr Glu Lys Asp Glu Asp Phe Leu Ser Ser Thr Arg Asn Thr Asn Ile
        495             500             505

tta cca act gaa gaa gaa ggg tat cca tta ctg tca gct gag ata gaa       1645
Leu Pro Thr Glu Glu Glu Gly Tyr Pro Leu Leu Ser Ala Glu Ile Glu
510             515             520             525

gaa ata gaa gat gca caa aaa caa gaa gct gct ctg ctg aca aaa tgg       1693
Glu Ile Glu Asp Ala Gln Lys Gln Glu Ala Ala Leu Leu Thr Lys Trp
            530             535             540

caa agg att atg gga att aac tat gaa ata gtg gtg gcc cat gtg agc       1741
Gln Arg Ile Met Gly Ile Asn Tyr Glu Ile Val Val Ala His Val Ser
        545             550             555

aag ttt agt gag aac agt gga ttg ggg ata agc ctg gaa gcg aca gtg       1789
Lys Phe Ser Glu Asn Ser Gly Leu Gly Ile Ser Leu Glu Ala Thr Val
        560             565             570

gga cat cat ttt atc cga tct gtt cta cca gag ggt cct gtt gga cac       1837
Gly His His Phe Ile Arg Ser Val Leu Pro Glu Gly Pro Val Gly His
        575             580             585

agc ggg aag ctc ttc agt gga gac gag cta ttg gaa gta aat ggc ata       1885
Ser Gly Lys Leu Phe Ser Gly Asp Glu Leu Leu Glu Val Asn Gly Ile
590             595             600             605

act tta ctt ggg gaa aat cac caa gat gtg gtg aat atc tta aaa gaa       1933
Thr Leu Leu Gly Glu Asn His Gln Asp Val Val Asn Ile Leu Lys Glu
            610             615             620

ctg cct ata gaa gtg aca atg gtg tgc tgt cgt cga act gtg cca ccc       1981
Leu Pro Ile Glu Val Thr Met Val Cys Cys Arg Arg Thr Val Pro Pro
            625             630             635
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acc acc caa tca gaa ttg gat agc ctg gac tta tgt gat att gag cta      2029
Thr Thr Gln Ser Glu Leu Asp Ser Leu Asp Leu Cys Asp Ile Glu Leu
        640             645             650

aca gaa aag cct cac gta gat cta ggt gag ttc atc ggg tca tca gag      2077
Thr Glu Lys Pro His Val Asp Leu Gly Glu Phe Ile Gly Ser Ser Glu
        655             660             665

cca gag gat cca gtg ctg gcg atg act gat gcg ggt cag agt aca gaa      2125
Pro Glu Asp Pro Val Leu Ala Met Thr Asp Ala Gly Gln Ser Thr Glu
670             675             680             685

gag gtt caa gca cct ttg gcc atg tgg gag gct ggc att cag cac ata      2173
Glu Val Gln Ala Pro Leu Ala Met Trp Glu Ala Gly Ile Gln His Ile
                690             695             700

atg ctg gag aaa ggg agc aaa gga ctt ggt ttt agc att tta gat tat      2221
Met Leu Glu Lys Gly Ser Lys Gly Leu Gly Phe Ser Ile Leu Asp Tyr
            705             710             715

cag gat cca att gat cca gca agc act gtg att ata att cgt tct ttg      2269
Gln Asp Pro Ile Asp Pro Ala Ser Thr Val Ile Ile Ile Arg Ser Leu
        720             725             730

gtg cct ggc ggc att gct gaa aag gat gga cga ctt ctt cct ggt gac      2317
Val Pro Gly Gly Ile Ala Glu Lys Asp Gly Arg Leu Leu Pro Gly Asp
    735             740             745

cga ctc atg ttt gta aac gat gtt aac ttg gaa aac agc agt ctt gag      2365
Arg Leu Met Phe Val Asn Asp Val Asn Leu Glu Asn Ser Ser Leu Glu
750             755             760             765

gaa gct gta gaa gca ctg aag gga gca ccg tca ggg act gtg aga ata      2413
Glu Ala Val Glu Ala Leu Lys Gly Ala Pro Ser Gly Thr Val Arg Ile
                770             775             780

gga gtt gct aag cct tta ccc ctt tca cca gaa gaa ggt tat gtt tct      2461
Gly Val Ala Lys Pro Leu Pro Leu Ser Pro Glu Glu Gly Tyr Val Ser
            785             790             795

gct aag gag gat tcc ttt ctc tac cca cca cac tcc tgt gag gaa gca      2509
Ala Lys Glu Asp Ser Phe Leu Tyr Pro Pro His Ser Cys Glu Glu Ala
        800             805             810

ggg ctg gct gac aaa ccc ctc ttc agg gct gac ttg gct ctg gtg ggc      2557
Gly Leu Ala Asp Lys Pro Leu Phe Arg Ala Asp Leu Ala Leu Val Gly
        815             820             825

aca aat gat gct gac tta gta gat gaa tcc aca ttt gag tct cca tac      2605
Thr Asn Asp Ala Asp Leu Val Asp Glu Ser Thr Phe Glu Ser Pro Tyr
830             835             840             845

tct cct gaa aat gac agc atc tac tct act caa gcc tct att tta tct      2653
Ser Pro Glu Asn Asp Ser Ile Tyr Ser Thr Gln Ala Ser Ile Leu Ser
            850             855             860

ctt cat ggc agt tct tgt ggt gat ggc ctg aac tat ggt tct tcc ctt      2701
Leu His Gly Ser Ser Cys Gly Asp Gly Leu Asn Tyr Gly Ser Ser Leu
            865             870             875
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cca tca tct cct cct aag gat gtt att gaa aat tct tgt gat cca gta    2749
Pro Ser Ser Pro Pro Lys Asp Val Ile Glu Asn Ser Cys Asp Pro Val
        880             885             890

ctt gat ctg cat atg tct ctg gag gaa cta tat acc cag aat ctc ctg    2797
Leu Asp Leu His Met Ser Leu Glu Glu Leu Tyr Thr Gln Asn Leu Leu
        895             900             905

gaa aga cag gat gag aat aca cct tcg gtg gac ata agt atg ggg cct    2845
Glu Arg Gln Asp Glu Asn Thr Pro Ser Val Asp Ile Ser Met Gly Pro
910             915             920             925

gct tct ggc ttt act ata aat gac tac aca cct gca aat gct att gaa    2893
Ala Ser Gly Phe Thr Ile Asn Asp Tyr Thr Pro Ala Asn Ala Ile Glu
        930             935             940

caa caa tat gaa tgt gaa aac aca ata gtg tgg act gaa tct cat tta    2941
Gln Gln Tyr Glu Cys Glu Asn Thr Ile Val Trp Thr Glu Ser His Leu
        945             950             955

cca agt gaa gtt ata tca agt gca gaa ctt cct tct gtg cta ccc gat    2989
Pro Ser Glu Val Ile Ser Ser Ala Glu Leu Pro Ser Val Leu Pro Asp
        960             965             970

tca gct gga aag ggc tct gag cac ctg ctt gaa cag agc tcc ctg gcc    3037
Ser Ala Gly Lys Gly Ser Glu His Leu Leu Glu Gln Ser Ser Leu Ala
        975             980             985

tgt aat gct gag tgt gtc atg ctt caa aat gta tct aaa gaa tct ttt    3085
Cys Asn Ala Glu Cys Val Met Leu Gln Asn Val Ser Lys Glu Ser Phe
 990             995             1000            1005

gaa agg act att aat ata gca aaa ggc aat tct agc cta gga atg aca    3133
Glu Arg Thr Ile Asn Ile Ala Lys Gly Asn Ser Ser Leu Gly Met Thr
            1010            1015            1020

gtt agt gct aat aaa gat ggc ttg ggg atg atc gtt cga agc att att    3181
Val Ser Ala Asn Lys Asp Gly Leu Gly Met Ile Val Arg Ser Ile Ile
            1025            1030            1035

cat gga ggt gcc att agt cga gat ggc cgg att gcc att ggg gac tgc    3229
His Gly Gly Ala Ile Ser Arg Asp Gly Arg Ile Ala Ile Gly Asp Cys
            1040            1045            1050

atc ttg tcc att aat gaa gag tct acc atc agt gta acc aat gcc cag    3277
Ile Leu Ser Ile Asn Glu Glu Ser Thr Ile Ser Val Thr Asn Ala Gln
        1055            1060            1065

gca cga gct atg ttg aga aga cat tct ctc att ggc cct gac ata aaa    3325
Ala Arg Ala Met Leu Arg Arg His Ser Leu Ile Gly Pro Asp Ile Lys
1070            1075            1080            1085

att act tat gtg cct gca gaa cat ttg gaa gag ttc aaa ata agc ttg    3373
Ile Thr Tyr Val Pro Ala Glu His Leu Glu Glu Phe Lys Ile Ser Leu
            1090            1095            1100

gga caa caa tct gga aga gta atg gca ctg gat att ttt tct tca tac    3421
Gly Gln Gln Ser Gly Arg Val Met Ala Leu Asp Ile Phe Ser Ser Tyr
            1105            1110            1115
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act ggc aga gac att cca gaa tta cca gag cga gaa gag gga gag ggt    3469
Thr Gly Arg Asp Ile Pro Glu Leu Pro Glu Arg Glu Glu Gly Glu Gly
        1120              1125              1130

gaa gaa agc gaa ctt caa aac aca gca tat agc aat tgg aat cag ccc    3517
Glu Glu Ser Glu Leu Gln Asn Thr Ala Tyr Ser Asn Trp Asn Gln Pro
        1135              1140              1145

agg cgg gtg gaa ctc tgg aga gaa cca agc aaa tcc tta ggc atc agc    3565
Arg Arg Val Glu Leu Trp Arg Glu Pro Ser Lys Ser Leu Gly Ile Ser
1150              1155              1160              1165

att gtt ggt gga cga ggg atg ggg agt cgg cta agc aat gga gaa gtg    3613
Ile Val Gly Gly Arg Gly Met Gly Ser Arg Leu Ser Asn Gly Glu Val
                1170              1175              1180

atg agg ggc att ttc atc aaa cat gtt ctg gaa gat agt cca gct ggc    3661
Met Arg Gly Ile Phe Ile Lys His Val Leu Glu Asp Ser Pro Ala Gly
                1185              1190              1195

aaa aat gga acc ttg aaa cct gga gat aga atc gta gag gca ccc agt    3709
Lys Asn Gly Thr Leu Lys Pro Gly Asp Arg Ile Val Glu Ala Pro Ser
        1200              1205              1210

cag tca gag tca gag cca gag aag gct cca ttg tgc agt gtg ccc cca    3757
Gln Ser Glu Ser Glu Pro Glu Lys Ala Pro Leu Cys Ser Val Pro Pro
        1215              1220              1225

ccc cct cct tca gcc ttt gcc gaa atg ggt agt gat cac aca cag tca    3805
Pro Pro Pro Ser Ala Phe Ala Glu Met Gly Ser Asp His Thr Gln Ser
1230              1235              1240              1245

tct gca agc aaa atc tca caa gat gtg gac aaa gag gat gag ttt ggt    3853
Ser Ala Ser Lys Ile Ser Gln Asp Val Asp Lys Glu Asp Glu Phe Gly
                1250              1255              1260

tac agc tgg aaa aat atc aga gag cgt tat gga acc cta aca ggc gag    3901
Tyr Ser Trp Lys Asn Ile Arg Glu Arg Tyr Gly Thr Leu Thr Gly Glu
                1265              1270              1275

ctg cat atg att gaa ctg gag aaa ggt cat agt ggt ttg ggc cta agt    3949
Leu His Met Ile Glu Leu Glu Lys Gly His Ser Gly Leu Gly Leu Ser
                1280              1285              1290

ctt gct ggg aac aaa gac cga tcc agg atg agt gtc ttc ata gtg ggg    3997
Leu Ala Gly Asn Lys Asp Arg Ser Arg Met Ser Val Phe Ile Val Gly
        1295              1300              1305

att gat cca aat gga gct gca gga aaa gat ggt cga ttg caa att gca    4045
Ile Asp Pro Asn Gly Ala Ala Gly Lys Asp Gly Arg Leu Gln Ile Ala
1310              1315              1320              1325

gat gag ctt cta gag atc aat ggt cag att tta tat gga aga agt cat    4093
Asp Glu Leu Leu Glu Ile Asn Gly Gln Ile Leu Tyr Gly Arg Ser His
                1330              1335              1340

cag aat gcc tca tca atc att aaa tgt gcc cct tct aaa gtg aaa ata    4141
Gln Asn Ala Ser Ser Ile Ile Lys Cys Ala Pro Ser Lys Val Lys Ile
                1345              1350              1355
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att ttt atc aga aat aaa gat gca gtg aat cag atg gcc gta tgt cct      4189
Ile Phe Ile Arg Asn Lys Asp Ala Val Asn Gln Met Ala Val Cys Pro
        1360             1365             1370

gga aat gca gta gaa cct ttg cct tct aac tca gaa aat ctt caa aat      4237
Gly Asn Ala Val Glu Pro Leu Pro Ser Asn Ser Glu Asn Leu Gln Asn
        1375             1380             1385

aag gag aca gag cca act gtt act act tct gat gca gct gtg gac ctc      4285
Lys Glu Thr Glu Pro Thr Val Thr Thr Ser Asp Ala Ala Val Asp Leu
1390             1395             1400             1405

agt tca ttt aaa aat gtg caa cat ctg gag ctt ccc aag gat cag ggg      4333
Ser Ser Phe Lys Asn Val Gln His Leu Glu Leu Pro Lys Asp Gln Gly
            1410             1415             1420

ggt ttg ggt att gct atc agc gaa gaa gat aca ctc agt gga gtc atc      4381
Gly Leu Gly Ile Ala Ile Ser Glu Glu Asp Thr Leu Ser Gly Val Ile
        1425             1430             1435

ata aag agc tta aca gag cat ggg gta gca gcc acg gat gga cga ctc      4429
Ile Lys Ser Leu Thr Glu His Gly Val Ala Ala Thr Asp Gly Arg Leu
        1440             1445             1450

aaa gtc gga gat cag ata ctg gct gta gat gat gaa att gtt gtt ggt      4477
Lys Val Gly Asp Gln Ile Leu Ala Val Asp Asp Glu Ile Val Val Gly
        1455             1460             1465

tac cct att gaa aag ttt att agc ctt ctg aag aca gca aag atg aca      4525
Tyr Pro Ile Glu Lys Phe Ile Ser Leu Leu Lys Thr Ala Lys Met Thr
1470             1475             1480             1485

gta aaa ctt acc atc cat gct gag aat cca gat tcc cag gct gtt cct      4573
Val Lys Leu Thr Ile His Ala Glu Asn Pro Asp Ser Gln Ala Val Pro
            1490             1495             1500

tca gca gct ggt gca gcc agt gga gaa aaa aag aac agc tcc cag tct      4621
Ser Ala Ala Gly Ala Ala Ser Gly Glu Lys Lys Asn Ser Ser Gln Ser
        1505             1510             1515

ctg atg gtc cca cag tct ggc tcc cca gaa ccg gag tcc atc cga aat      4669
Leu Met Val Pro Gln Ser Gly Ser Pro Glu Pro Glu Ser Ile Arg Asn
        1520             1525             1530

aca agc aga tca tca aca cca gca att ttt gct tct gat cct gca acc      4717
Thr Ser Arg Ser Ser Thr Pro Ala Ile Phe Ala Ser Asp Pro Ala Thr
        1535             1540             1545

tgc ccc att atc cct ggc tgc gaa aca acc atc gag att tcc aaa ggg      4765
Cys Pro Ile Ile Pro Gly Cys Glu Thr Thr Ile Glu Ile Ser Lys Gly
1550             1555             1560             1565

cga aca ggg ctg ggc ctg agc atc gtt ggg ggt tca gac acg ctg ctg      4813
Arg Thr Gly Leu Gly Leu Ser Ile Val Gly Gly Ser Asp Thr Leu Leu
            1570             1575             1580

ggt gcc ttt att atc cat gaa gtt tat gaa gaa gga gca gca tgt aaa      4861
Gly Ala Phe Ile Ile His Glu Val Tyr Glu Glu Gly Ala Ala Cys Lys
            1585             1590             1595
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gat gga aga ctc tgg gct gga gat cag atc tta gag gtg aat gga att        4909
Asp Gly Arg Leu Trp Ala Gly Asp Gln Ile Leu Glu Val Asn Gly Ile
        1600             1605                 1610

gac ttg agg aag gcc aca cat gat gaa gca atc aat gtc ctg aga cag        4957
Asp Leu Arg Lys Ala Thr His Asp Glu Ala Ile Asn Val Leu Arg Gln
        1615             1620                 1625

acg cca cag aga gtg cgc ctg aca ctc tac aga gat gag gcc cca tac        5005
Thr Pro Gln Arg Val Arg Leu Thr Leu Tyr Arg Asp Glu Ala Pro Tyr
1630             1635                 1640                 1645

aaa gag gag gaa gtg tgt gac acc ctc act att gag ctg cag aag aag        5053
Lys Glu Glu Glu Val Cys Asp Thr Leu Thr Ile Glu Leu Gln Lys Lys
                1650                 1655                 1660

ccg gga aaa ggc cta gga tta agt att gtt ggt aaa aga aac gat act        5101
Pro Gly Lys Gly Leu Gly Leu Ser Ile Val Gly Lys Arg Asn Asp Thr
            1665                 1670                 1675

gga gta ttt gtg tca gac att gtc aaa gga gga att gca gat ccc gat        5149
Gly Val Phe Val Ser Asp Ile Val Lys Gly Gly Ile Ala Asp Pro Asp
        1680                 1685                 1690

gga aga ctg atc cag gga gac cag ata tta ttg gtg aat ggg gaa gac        5197
Gly Arg Leu Ile Gln Gly Asp Gln Ile Leu Leu Val Asn Gly Glu Asp
        1695             1700                 1705

gtt cgt aat gcc tcc caa gaa gcg gtt gcc gct ttg cta aag tgt tcc        5245
Val Arg Asn Ala Ser Gln Glu Ala Val Ala Ala Leu Leu Lys Cys Ser
1710             1715                 1720                 1725

cta ggc aca gta acc ttg gaa gtt gga aga atc aaa gct ggt cca ttc        5293
Leu Gly Thr Val Thr Leu Glu Val Gly Arg Ile Lys Ala Gly Pro Phe
                1730                 1735                 1740

cat tca gag agg agg cca tct caa acc agc cag gtg agt gaa ggc agc        5341
His Ser Glu Arg Arg Pro Ser Gln Thr Ser Gln Val Ser Glu Gly Ser
            1745                 1750                 1755

ctg tct tct ttc act ttt cca ctc tct gga tcc agt aca tct gag tca        5389
Leu Ser Ser Phe Thr Phe Pro Leu Ser Gly Ser Ser Thr Ser Glu Ser
        1760                 1765                 1770

ctg gaa agt agc tca aag aag aat gca ttg gca tct gaa ata cag gga        5437
Leu Glu Ser Ser Ser Lys Lys Asn Ala Leu Ala Ser Glu Ile Gln Gly
        1775             1780                 1785

tta aga aca gtc gaa atg aaa aag ggc cct act gac tca ctg gga atc        5485
Leu Arg Thr Val Glu Met Lys Lys Gly Pro Thr Asp Ser Leu Gly Ile
1790             1795                 1800                 1805

agc atc gct gga gga gta ggc agc cca ctt ggt gat gtg cct ata ttt        5533
Ser Ile Ala Gly Gly Val Gly Ser Pro Leu Gly Asp Val Pro Ile Phe
            1810                 1815                 1820

att gca atg atg cac cca act gga gtt gca gca cag acc caa aaa ctc        5581
Ile Ala Met Met His Pro Thr Gly Val Ala Ala Gln Thr Gln Lys Leu
            1825                 1830                 1835
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aga gtt ggg gat agg att gtc acc atc tgt ggc aca tcc act gag ggc        5629
Arg Val Gly Asp Arg Ile Val Thr Ile Cys Gly Thr Ser Thr Glu Gly
    1840                    1845                1850

atg act cac acc caa gca gtt aac cta ctg aaa aat gca tct ggc tcc        5677
Met Thr His Thr Gln Ala Val Asn Leu Leu Lys Asn Ala Ser Gly Ser
    1855                    1860                1865

att gaa atg cag gtg gtt gct gga gga gac gtg agt gtg gtc aca ggt        5725
Ile Glu Met Gln Val Val Ala Gly Gly Asp Val Ser Val Val Thr Gly
1870                    1875                1880                1885

cat cat cag gag cct gca agt tcc agt ctt tct ttc act ggg ctg acg        5773
His His Gln Glu Pro Ala Ser Ser Ser Leu Ser Phe Thr Gly Leu Thr
                    1890                1895                1900

tca acc agt ata ttt cag gat gat tta gga cct cct caa tgt aag tct        5821
Ser Thr Ser Ile Phe Gln Asp Asp Leu Gly Pro Pro Gln Cys Lys Ser
                1905                1910                1915

att aca cta gag cga gga cca gat ggc tta ggc ttc agt ata gtt gga        5869
Ile Thr Leu Glu Arg Gly Pro Asp Gly Leu Gly Phe Ser Ile Val Gly
            1920                1925                1930

gga tat ggc agc cct cat gga gac tta ccc att tat gtt aaa aca gtg        5917
Gly Tyr Gly Ser Pro His Gly Asp Leu Pro Ile Tyr Val Lys Thr Val
    1935                    1940                1945

ttt gca aag gga gca gcc tct gaa gac gga cgt ctg aaa agg ggc gat        5965
Phe Ala Lys Gly Ala Ala Ser Glu Asp Gly Arg Leu Lys Arg Gly Asp
1950                    1955                1960                1965

cag atc att gct gtc aat ggg cag agt cta gaa gga gtc acc cat gaa        6013
Gln Ile Ile Ala Val Asn Gly Gln Ser Leu Glu Gly Val Thr His Glu
                1970                1975                1980

gaa gct gtt gcc atc ctt aaa cgg aca aaa ggc act gtc act ttg atg        6061
Glu Ala Val Ala Ile Leu Lys Arg Thr Lys Gly Thr Val Thr Leu Met
            1985                1990                1995

gtt ctc tct tgaattggct gccagaattg aaccaaccca acccctagct             6110
Val Leu Ser
        2000

cacctcctac tgtaaagaga atgcactggt cctgacaatt tttatgctgt gttcagccgg     6170
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            Met Leu Glu Ala Ile Asp Lys Asn Arg Ala Leu His Ala
            1   5   10

gca gag cgc ttg caa acc aag ctg cga gaa cgt ggg gat gta gca aat   157
Ala Glu Arg Leu Gln Thr Lys Leu Arg Glu Arg Gly Asp Val Ala Asn
    15   20   25

gaa gac aaa ctg agc ctt ctg aag tca gtc ctg cag agc cct ctc ttc   205
Glu Asp Lys Leu Ser Leu Leu Lys Ser Val Leu Gln Ser Pro Leu Phe
 30   35   40   45

agt cag att ctg agc ctt cag act tct gta cag cag ctg aaa gac cag   253
Ser Gln Ile Leu Ser Leu Gln Thr Ser Val Gln Gln Leu Lys Asp Gln
                50   55   60

gta aat att gca act tca gca act tca aat att gaa tat gcc cac gtt   301
Val Asn Ile Ala Thr Ser Ala Thr Ser Asn Ile Glu Tyr Ala His Val
                65   70   75

cct cat ctc agc cca gct gtg att cct act ctg caa aat gaa tcg ttt   349
Pro His Leu Ser Pro Ala Val Ile Pro Thr Leu Gln Asn Glu Ser Phe
            80   85   90

tta tta tcc cca aac aat ggg aat ctg gaa gca ctt aca gga cct ggt   397
Leu Leu Ser Pro Asn Asn Gly Asn Leu Glu Ala Leu Thr Gly Pro Gly
     95   100   105

att cca cac att aat ggg aaa cct gct tgt gat gaa ttt gat cag ctt   445
Ile Pro His Ile Asn Gly Lys Pro Ala Cys Asp Glu Phe Asp Gln Leu
110   115   120   125

atc aaa aat atg gcc cag ggt cgc cat gta gaa gtt ttt gag ctc ctc   493
Ile Lys Asn Met Ala Gln Gly Arg His Val Glu Val Phe Glu Leu Leu
                130   135   140

aaa cct cca tct gga ggc ctt ggg ttt agt gtt gtg gga cta aga agt   541
Lys Pro Pro Ser Gly Gly Leu Gly Phe Ser Val Val Gly Leu Arg Ser
                145   150   155

gaa aac aga gga gag ctg gga ata ttt gtt caa gag ata caa gag ggc   589
Glu Asn Arg Gly Glu Leu Gly Ile Phe Val Gln Glu Ile Gln Glu Gly
            160   165   170

agt gtg gcc cat aga gat gga aga ttg aaa gaa act gat caa att ctt   637
Ser Val Ala His Arg Asp Gly Arg Leu Lys Glu Thr Asp Gln Ile Leu
    175   180   185

gct atc aat gga cag gct ctt gat cag aca att aca cat cag cag gct   685
Ala Ile Asn Gly Gln Ala Leu Asp Gln Thr Ile Thr His Gln Gln Ala
190   195   200   205

atc agc atc ctg cag aaa gcc aaa gat act gtc cag cta gtt att gcc   733
Ile Ser Ile Leu Gln Lys Ala Lys Asp Thr Val Gln Leu Val Ile Ala
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aga ggc tca ttg cct cag ctt gtc agc ccc ata gtt tcc cgt tct cca   781
Arg Gly Ser Leu Pro Gln Leu Val Ser Pro Ile Val Ser Arg Ser Pro
                225   230   235

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tct gca gcc agc aca att tca gct cac tct aat ccg gtt cac tgg caa        829
Ser Ala Ala Ser Thr Ile Ser Ala His Ser Asn Pro Val His Trp Gln
        240             245             250

cac atg gaa acg att gaa ttg gtg aat gat gga tct ggt ttg gga ttt        877
His Met Glu Thr Ile Glu Leu Val Asn Asp Gly Ser Gly Leu Gly Phe
        255             260             265

ggc atc ata gga gga aaa gca act ggt gtg ata gta aaa acc att ctg        925
Gly Ile Ile Gly Gly Lys Ala Thr Gly Val Ile Val Lys Thr Ile Leu
270             275             280             285

cct gga gga gta gct gat cag cat ggg cgt tta tgc agt gga gac cac        973
Pro Gly Gly Val Ala Asp Gln His Gly Arg Leu Cys Ser Gly Asp His
        290             295             300

att cta aag att ggt gac aca gat cta gca gga atg agc agt gag caa       1021
Ile Leu Lys Ile Gly Asp Thr Asp Leu Ala Gly Met Ser Ser Glu Gln
        305             310             315

gta gca caa gtc ctt agg caa tgt gga aat aga gtt aag ttg atg att       1069
Val Ala Gln Val Leu Arg Gln Cys Gly Asn Arg Val Lys Leu Met Ile
        320             325             330

gca aga agt gcc ata gaa gaa cgt aca gca ccc act gct ttg ggc atc       1117
Ala Arg Ser Ala Ile Glu Glu Arg Thr Ala Pro Thr Ala Leu Gly Ile
        335             340             345

acc ctc tcc tca tcc cca act tca acg cca gag ttg cgg gtt gat gct       1165
Thr Leu Ser Ser Ser Pro Thr Ser Thr Pro Glu Leu Arg Val Asp Ala
350             355             360             365

tct act cag aaa ggt gaa gaa agt gag aca ttt gat gta gaa ctc act       1213
Ser Thr Gln Lys Gly Glu Glu Ser Glu Thr Phe Asp Val Glu Leu Thr
        370             375             380

aaa aat gtc caa gga tta gga att acc att gct ggc tac att gga gat       1261
Lys Asn Val Gln Gly Leu Gly Ile Thr Ile Ala Gly Tyr Ile Gly Asp
        385             390             395

aaa aaa ttg gaa cct tca gga atc ttt gta aag agc att aca aaa agc       1309
Lys Lys Leu Glu Pro Ser Gly Ile Phe Val Lys Ser Ile Thr Lys Ser
        400             405             410

agt gcc gtt gag cat gat gga aga atc caa att gga gac caa att ata       1357
Ser Ala Val Glu His Asp Gly Arg Ile Gln Ile Gly Asp Gln Ile Ile
        415             420             425

gca gta gat ggc aca aac ctt cag ggt ttt act aat cag caa gca gta       1405
Ala Val Asp Gly Thr Asn Leu Gln Gly Phe Thr Asn Gln Gln Ala Val
430             435             440             445

gag gta ttg cga cat aca gga caa act gtg ctc ctg aca cta atg agg       1453
Glu Val Leu Arg His Thr Gly Gln Thr Val Leu Leu Thr Leu Met Arg
        450             455             460

aga gga atg aag cag gaa gcc gag ctc atg tca agg gaa gac gtc aca       1501
Arg Gly Met Lys Gln Glu Ala Glu Leu Met Ser Arg Glu Asp Val Thr
        465             470             475
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aaa gat gca gat ttg tct cct gtt aat gcc agc ata atc aaa gaa aat       1549
Lys Asp Ala Asp Leu Ser Pro Val Asn Ala Ser Ile Ile Lys Glu Asn
        480             485             490

tat gaa aaa gat gaa gat ttt tta tct tcg acg aga aac acc aac ata       1597
Tyr Glu Lys Asp Glu Asp Phe Leu Ser Ser Thr Arg Asn Thr Asn Ile
        495             500             505

tta cca act gaa gaa gaa ggg tat cca tta ctg tca gct gag ata gaa       1645
Leu Pro Thr Glu Glu Glu Gly Tyr Pro Leu Leu Ser Ala Glu Ile Glu
510             515             520             525

gaa ata gaa gat gca caa aaa caa gaa gct gct ctg ctg aca aaa tgg       1693
Glu Ile Glu Asp Ala Gln Lys Gln Glu Ala Ala Leu Leu Thr Lys Trp
            530             535             540

caa agg att atg gga att aac tat gaa ata gtg gtg gcc cat gtg agc       1741
Gln Arg Ile Met Gly Ile Asn Tyr Glu Ile Val Val Ala His Val Ser
            545             550             555

aag ttt agt gag aac agt gga ttg ggg ata agc ctg gaa gcg aca gtg       1789
Lys Phe Ser Glu Asn Ser Gly Leu Gly Ile Ser Leu Glu Ala Thr Val
            560             565             570

gga cat cat ttt atc cga tct gtt cta cca gag ggt cct gtt gga cac       1837
Gly His His Phe Ile Arg Ser Val Leu Pro Glu Gly Pro Val Gly His
            575             580             585

agc ggg aag ctc ttc agt gga gac gag cta ttg gaa gta aat ggc ata       1885
Ser Gly Lys Leu Phe Ser Gly Asp Glu Leu Leu Glu Val Asn Gly Ile
590             595             600             605

act tta ctt ggg gaa aat cac caa gat gtg gtg aat atc tta aaa gaa       1933
Thr Leu Leu Gly Glu Asn His Gln Asp Val Val Asn Ile Leu Lys Glu
            610             615             620

ctg cct ata gaa gtg aca atg gtg tgc tgt cgt cga act gtg cca ccc       1981
Leu Pro Ile Glu Val Thr Met Val Cys Cys Arg Arg Thr Val Pro Pro
            625             630             635

acc acc caa tca gaa ttg gat agc ctg gac tta tgt gat att gag cta       2029
Thr Thr Gln Ser Glu Leu Asp Ser Leu Asp Leu Cys Asp Ile Glu Leu
            640             645             650

aca gaa aag cct cac gta gat cta ggt gag ttc atc ggg tca tca gag       2077
Thr Glu Lys Pro His Val Asp Leu Gly Glu Phe Ile Gly Ser Ser Glu
            655             660             665

cca gag gat cca gtg ctg gcg atg act gat gcg ggt cag agt aca gaa       2125
Pro Glu Asp Pro Val Leu Ala Met Thr Asp Ala Gly Gln Ser Thr Glu
670             675             680             685

gag gtt caa gca cct ttg gcc atg tgg gag gct ggc att cag cac ata       2173
Glu Val Gln Ala Pro Leu Ala Met Trp Glu Ala Gly Ile Gln His Ile
            690             695             700

atg ctg gag aaa ggg agc aaa gga ctt ggt ttt agc att tta gat tat       2221
Met Leu Glu Lys Gly Ser Lys Gly Leu Gly Phe Ser Ile Leu Asp Tyr
            705             710             715
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cag gat cca att gat cca gca agc act gtg att ata att cgt tct ttg          2269
Gln Asp Pro Ile Asp Pro Ala Ser Thr Val Ile Ile Ile Arg Ser Leu
        720             725             730

gtg cct ggc ggc att gct gaa aag gat gga cga ctt ctt cct ggt gac          2317
Val Pro Gly Gly Ile Ala Glu Lys Asp Gly Arg Leu Leu Pro Gly Asp
        735             740             745

cga ctc atg ttt gta aac gat gtt aac ttg gaa aac agc agt ctt gag          2365
Arg Leu Met Phe Val Asn Asp Val Asn Leu Glu Asn Ser Ser Leu Glu
750             755             760             765

gaa gct gta gaa gca ctg aag gga gca ccg tca ggg act gtg aga ata          2413
Glu Ala Val Glu Ala Leu Lys Gly Ala Pro Ser Gly Thr Val Arg Ile
                770             775             780

gga gtt gct aag cct tta ccc ctt tca cca gaa gaa ggt tat gtt tct          2461
Gly Val Ala Lys Pro Leu Pro Leu Ser Pro Glu Glu Gly Tyr Val Ser
                785             790             795

gct aag gag gat tcc ttt ctc tac cca cca cac tcc tgt gag gaa gca          2509
Ala Lys Glu Asp Ser Phe Leu Tyr Pro Pro His Ser Cys Glu Glu Ala
        800             805             810

ggg ctg gct gac aaa ccc ctc ttc agg gct gac ttg gct ctg gtg ggc          2557
Gly Leu Ala Asp Lys Pro Leu Phe Arg Ala Asp Leu Ala Leu Val Gly
        815             820             825

aca aat gat gct gac tta gta gat gaa tcc aca ttt gag tct cca tac          2605
Thr Asn Asp Ala Asp Leu Val Asp Glu Ser Thr Phe Glu Ser Pro Tyr
830             835             840             845

tct cct gaa aat gac agc atc tac tct act caa gcc tct att tta tct          2653
Ser Pro Glu Asn Asp Ser Ile Tyr Ser Thr Gln Ala Ser Ile Leu Ser
                850             855             860

ctt cat ggc agt tct tgt ggt gat ggc ctg aac tat ggt tct tcc ctt          2701
Leu His Gly Ser Ser Cys Gly Asp Gly Leu Asn Tyr Gly Ser Ser Leu
                865             870             875

cca tca tct cct cct aag gat gtt att gaa aat tct tgt gat cca gta          2749
Pro Ser Ser Pro Pro Lys Asp Val Ile Glu Asn Ser Cys Asp Pro Val
                880             885             890

ctt gat ctg cat atg tct ctg gag gaa cta tat acc cag aat ctc ctg          2797
Leu Asp Leu His Met Ser Leu Glu Glu Leu Tyr Thr Gln Asn Leu Leu
                895             900             905

gaa aga cag gat gag aat aca cct tcg gtg gac ata agt atg ggg cct          2845
Glu Arg Gln Asp Glu Asn Thr Pro Ser Val Asp Ile Ser Met Gly Pro
910             915             920             925

gct tct ggc ttt act ata aat gac tac aca cct gca aat gct att gaa          2893
Ala Ser Gly Phe Thr Ile Asn Asp Tyr Thr Pro Ala Asn Ala Ile Glu
                930             935             940

caa caa tat gaa tgt gaa aac aca ata gtg tgg act gaa tct cat tta          2941
Gln Gln Tyr Glu Cys Glu Asn Thr Ile Val Trp Thr Glu Ser His Leu
                945             950             955
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cca agt gaa gtt ata tca agt gca gaa ctt cct tct gtg cta ccc gat      2989
Pro Ser Glu Val Ile Ser Ser Ala Glu Leu Pro Ser Val Leu Pro Asp
        960             965             970

tca gct gga aag ggc tct gag tac ctg ctt gaa cag agc tcc ctg gcc      3037
Ser Ala Gly Lys Gly Ser Glu Tyr Leu Leu Glu Gln Ser Ser Leu Ala
    975             980             985

tgt aat gct gag tgt gtc atg ctt caa aat gta tct aaa gaa tct ttt      3085
Cys Asn Ala Glu Cys Val Met Leu Gln Asn Val Ser Lys Glu Ser Phe
 990             995             1000            1005

gaa agg act att aat ata gca aaa ggc aat tct agc cta gga atg aca      3133
Glu Arg Thr Ile Asn Ile Ala Lys Gly Asn Ser Ser Leu Gly Met Thr
            1010            1015            1020

gtt agt gct aat aaa gat ggc ttg ggg atg atc gtt cga agc att att      3181
Val Ser Ala Asn Lys Asp Gly Leu Gly Met Ile Val Arg Ser Ile Ile
            1025            1030            1035

cat gga ggt gcc att agt cga gat ggc cgg att gcc att ggg gac tgc      3229
His Gly Gly Ala Ile Ser Arg Asp Gly Arg Ile Ala Ile Gly Asp Cys
        1040            1045            1050

atc ttg tcc att aat gaa gag tct acc atc agt gta acc aat gcc cag      3277
Ile Leu Ser Ile Asn Glu Glu Ser Thr Ile Ser Val Thr Asn Ala Gln
    1055            1060            1065

gca cga gct atg ttg aga aga cat tct ctc att ggc cct gac ata aaa      3325
Ala Arg Ala Met Leu Arg Arg His Ser Leu Ile Gly Pro Asp Ile Lys
1070            1075            1080            1085

att act tat gtg cct gca gaa cat ttg gaa gag ttc aaa ata agc ttg      3373
Ile Thr Tyr Val Pro Ala Glu His Leu Glu Glu Phe Lys Ile Ser Leu
            1090            1095            1100

gga caa caa tct gga aga gta atg gca ctg gat att ttt tct tca tac      3421
Gly Gln Gln Ser Gly Arg Val Met Ala Leu Asp Ile Phe Ser Ser Tyr
            1105            1110            1115

act ggc aga gac att cca gaa tta cca gag cga gaa gag gga gag ggt      3469
Thr Gly Arg Asp Ile Pro Glu Leu Pro Glu Arg Glu Glu Gly Glu Gly
        1120            1125            1130

gaa gaa agc gaa ctt caa aac aca gca tat agc aat tgg aat cag ccc      3517
Glu Glu Ser Glu Leu Gln Asn Thr Ala Tyr Ser Asn Trp Asn Gln Pro
        1135            1140            1145

agg cgg gtg gaa ctt tgg aga gaa cca agc aaa tcc tta ggc atc agc      3565
Arg Arg Val Glu Leu Trp Arg Glu Pro Ser Lys Ser Leu Gly Ile Ser
1150            1155            1160            1165

att gtt ggt gga cga ggg atg ggg agt cgg cta agc aat gga gaa gtg      3613
Ile Val Gly Gly Arg Gly Met Gly Ser Arg Leu Ser Asn Gly Glu Val
            1170            1175            1180

atg agg ggc att ttc atc aaa cat gtt ctg gaa gat agg cca gct ggc      3661
Met Arg Gly Ile Phe Ile Lys His Val Leu Glu Asp Arg Pro Ala Gly
            1185            1190            1195
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aaa aat gga acc ttg aag cct gga gat aga atc gta gag gtg gat gga     3709
Lys Asn Gly Thr Leu Lys Pro Gly Asp Arg Ile Val Glu Val Asp Gly
        1200            1205            1210

atg gac ctc aga gat gca agc cat gaa caa gct gtg gaa gcc att cgg     3757
Met Asp Leu Arg Asp Ala Ser His Glu Gln Ala Val Glu Ala Ile Arg
        1215            1220            1225

aaa gca ggc aac cct gta gtc ttt atg gta cag agc att ata aac aga     3805
Lys Ala Gly Asn Pro Val Val Phe Met Val Gln Ser Ile Ile Asn Arg
1230            1235            1240            1245

cca agg aaa tcc cct ttg cct tcc ttg ctg cac aac ctt tac cct aag     3853
Pro Arg Lys Ser Pro Leu Pro Ser Leu Leu His Asn Leu Tyr Pro Lys
        1250            1255            1260

tac aac ttc agc agc act aac cca ttt gct gac tct cta caa atc aac     3901
Tyr Asn Phe Ser Ser Thr Asn Pro Phe Ala Asp Ser Leu Gln Ile Asn
        1265            1270            1275

gcc gac aag gca ccc agt cag tca gag tca gag cca gag aag gct cca     3949
Ala Asp Lys Ala Pro Ser Gln Ser Glu Ser Glu Pro Glu Lys Ala Pro
        1280            1285            1290

ttg tgc agt gtg ccc cca ccc cct cct tca gcc ttt gcc gaa atg ggt     3997
Leu Cys Ser Val Pro Pro Pro Pro Pro Ser Ala Phe Ala Glu Met Gly
        1295            1300            1305

agt gat cac aca cag tca tct gca agc aaa atc tca caa gat gtg gac     4045
Ser Asp His Thr Gln Ser Ser Ala Ser Lys Ile Ser Gln Asp Val Asp
1310            1315            1320            1325

aaa gag gat gag ttt ggt tac agc tgg aaa aat atc aga gag cgt tat     4093
Lys Glu Asp Glu Phe Gly Tyr Ser Trp Lys Asn Ile Arg Glu Arg Tyr
        1330            1335            1340

gga acc cta aca ggc gag ctg cat atg att gaa ctg gag aaa ggt cat     4141
Gly Thr Leu Thr Gly Glu Leu His Met Ile Glu Leu Glu Lys Gly His
        1345            1350            1355

agt ggt ttg ggc cta agt ctt gct ggg aac aaa gac cga tcc agg atg     4189
Ser Gly Leu Gly Leu Ser Leu Ala Gly Asn Lys Asp Arg Ser Arg Met
        1360            1365            1370

agt gtc ttc ata gtg ggg att gat cca aat gga gct gca gga aaa gat     4237
Ser Val Phe Ile Val Gly Ile Asp Pro Asn Gly Ala Ala Gly Lys Asp
        1375            1380            1385

ggt cga ttg caa att gca gat gag ctt cta gag atc aat ggt cag att     4285
Gly Arg Leu Gln Ile Ala Asp Glu Leu Leu Glu Ile Asn Gly Gln Ile
1390            1395            1400            1405

tta tat gga aga agt cat cag aat gcc tca tca atc att aaa tgt gcc     4333
Leu Tyr Gly Arg Ser His Gln Asn Ala Ser Ser Ile Ile Lys Cys Ala
        1410            1415            1420

cct tct aaa gtg aaa ata att ttt atc aga aat aaa gat gca gtg aat     4381
Pro Ser Lys Val Lys Ile Ile Phe Ile Arg Asn Lys Asp Ala Val Asn
        1425            1430            1435
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cag atg gcc gta tgt cct gga aat gca gta gaa cct ttg cct tct aac       4429
Gln Met Ala Val Cys Pro Gly Asn Ala Val Glu Pro Leu Pro Ser Asn
        1440            1445                1450

tca gaa aat ctt caa aat aag gag aca gag cca act gtt act act tct       4477
Ser Glu Asn Leu Gln Asn Lys Glu Thr Glu Pro Thr Val Thr Thr Ser
    1455            1460                1465

gat gca gct gtg gac ctc agt tca ttt aaa aat gtg caa cat ctg gag       4525
Asp Ala Ala Val Asp Leu Ser Ser Phe Lys Asn Val Gln His Leu Glu
1470            1475            1480                    1485

ctt ccc aag gat cag ggg ggt ttg ggt att gct atc agc gaa gaa gat       4573
Leu Pro Lys Asp Gln Gly Gly Leu Gly Ile Ala Ile Ser Glu Glu Asp
            1490            1495            1500

aca ctc agt gga gtc atc ata aag agc tta aca gag cat ggg gta gca       4621
Thr Leu Ser Gly Val Ile Ile Lys Ser Leu Thr Glu His Gly Val Ala
            1505            1510            1515

gcc acg gat gga cga ctc aaa gtc gga gat cag ata ctg gct gta gat       4669
Ala Thr Asp Gly Arg Leu Lys Val Gly Asp Gln Ile Leu Ala Val Asp
        1520            1525                1530

gat gaa att gtt gtt ggt tac cct att gaa aag ttt att agc ctt ctg       4717
Asp Glu Ile Val Val Gly Tyr Pro Ile Glu Lys Phe Ile Ser Leu Leu
    1535            1540                1545

aag aca gca aag atg aca gta aaa ctt acc atc cat gct gag aat cca       4765
Lys Thr Ala Lys Met Thr Val Lys Leu Thr Ile His Ala Glu Asn Pro
1550            1555                1560                    1565

gat tcc cag gct gtt cct tca gca gct ggt gca gcc agt gga gaa aaa       4813
Asp Ser Gln Ala Val Pro Ser Ala Ala Gly Ala Ala Ser Gly Glu Lys
            1570            1575            1580

aag aac agc tcc cag tct ctg atg gtc cca cag tct ggc tcc cca gaa       4861
Lys Asn Ser Ser Gln Ser Leu Met Val Pro Gln Ser Gly Ser Pro Glu
            1585            1590            1595

ccg gag tcc atc cga aat aca agc aga tca tca aca cca gca att ttt       4909
Pro Glu Ser Ile Arg Asn Thr Ser Arg Ser Ser Thr Pro Ala Ile Phe
        1600            1605                1610

gct tct gat cct gca acc tgc ccc att atc cct ggc tgc gaa aca acc       4957
Ala Ser Asp Pro Ala Thr Cys Pro Ile Ile Pro Gly Cys Glu Thr Thr
        1615            1620                1625

atc gag att tcc aaa ggg cga aca ggg ctg ggc ctg agc atc gtt ggg       5005
Ile Glu Ile Ser Lys Gly Arg Thr Gly Leu Gly Leu Ser Ile Val Gly
1630            1635                1640                    1645

ggt tca gac acg ctg ctg ggt gcc ttt att atc cat gaa gtt tat gaa       5053
Gly Ser Asp Thr Leu Leu Gly Ala Phe Ile Ile His Glu Val Tyr Glu
            1650            1655            1660

gaa gga gca gca tgt aaa gat gga aga ctc tgg gct gga gat cag atc       5101
Glu Gly Ala Ala Cys Lys Asp Gly Arg Leu Trp Ala Gly Asp Gln Ile
            1665            1670            1675
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tta gag gtg aat gga att gac ttg agg aag gcc aca cat gat gaa gca        5149
Leu Glu Val Asn Gly Ile Asp Leu Arg Lys Ala Thr His Asp Glu Ala
        1680            1685            1690

atc aat gtc ctg aga cag acg cca cag aga gtg cgc ctg aca ctc tac        5197
Ile Asn Val Leu Arg Gln Thr Pro Gln Arg Val Arg Leu Thr Leu Tyr
        1695            1700            1705

aga gat gag gcc cca tac aaa gag gag gaa gtg tgt gac acc ctc act        5245
Arg Asp Glu Ala Pro Tyr Lys Glu Glu Glu Val Cys Asp Thr Leu Thr
1710            1715            1720            1725

att gag ctg cag aag aag ccg gga aaa ggc cta gga tta agt att gtt        5293
Ile Glu Leu Gln Lys Lys Pro Gly Lys Gly Leu Gly Leu Ser Ile Val
        1730            1735            1740

ggt aaa aga aac gat act gga gta ttt gtg tca gac att gtc aaa gga        5341
Gly Lys Arg Asn Asp Thr Gly Val Phe Val Ser Asp Ile Val Lys Gly
        1745            1750            1755

gga att gca gat ccc gat gga aga ctg atc cag gga gac cag ata tta        5389
Gly Ile Ala Asp Pro Asp Gly Arg Leu Ile Gln Gly Asp Gln Ile Leu
        1760            1765            1770

ttg gtg aat ggg gaa gac gtt cgt aat gcc tcc caa gaa gcg gtt gcc        5437
Leu Val Asn Gly Glu Asp Val Arg Asn Ala Ser Gln Glu Ala Val Ala
        1775            1780            1785

gct ttg cta aag tgt tcc cta ggc aca gta acc ttg gaa gtt gga aga        5485
Ala Leu Leu Lys Cys Ser Leu Gly Thr Val Thr Leu Glu Val Gly Arg
1790            1795            1800            1805

atc aaa gct ggt cca ttc cat tca gag agg agg cca tct caa acc agc        5533
Ile Lys Ala Gly Pro Phe His Ser Glu Arg Arg Pro Ser Gln Thr Ser
        1810            1815            1820

cag gtg agt gaa ggc agc ctg tct tct ttc act ttt cca ctc tct gga        5581
Gln Val Ser Glu Gly Ser Leu Ser Ser Phe Thr Phe Pro Leu Ser Gly
        1825            1830            1835

tcc agt aca tct gag tca ctg gaa agt agc tca aag aag aat gca ttg        5629
Ser Ser Thr Ser Glu Ser Leu Glu Ser Ser Ser Lys Lys Asn Ala Leu
        1840            1845            1850

gca tct gaa ata cag gga tta aga aca gtc gaa atg aaa aag ggc cct        5677
Ala Ser Glu Ile Gln Gly Leu Arg Thr Val Glu Met Lys Lys Gly Pro
        1855            1860            1865

act gac tca ctg gga atc agc atc gct gga gga gta ggc agc cca ctt       ·5725
Thr Asp Ser Leu Gly Ile Ser Ile Ala Gly Gly Val Gly Ser Pro Leu
1870            1875            1880            1885

ggt gat gtg cct ata ttt att gca atg atg cac cca act gga gtt gca        5773
Gly Asp Val Pro Ile Phe Ile Ala Met Met His Pro Thr Gly Val Ala
        1890            1895            1900

gca cag acc caa aaa ctc aga gtt ggg gat agg att gtc acc atc tgt        5821
Ala Gln Thr Gln Lys Leu Arg Val Gly Asp Arg Ile Val Thr Ile Cys
        1905            1910            1915
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ggc aca tcc act gag ggc atg act cac acc caa gca gtt aac cta ctg      5869
Gly Thr Ser Thr Glu Gly Met Thr His Thr Gln Ala Val Asn Leu Leu
        1920             1925             1930

aaa aat gca tct ggc tcc att gaa atg cag gtg gtt gct gga gga gac      5917
Lys Asn Ala Ser Gly Ser Ile Glu Met Gln Val Val Ala Gly Gly Asp
        1935             1940             1945

gtg agt gtg gtc aca ggt cat cat cag gag cct gca agt tcc agt ctt      5965
Val Ser Val Val Thr Gly His His Gln Glu Pro Ala Ser Ser Ser Leu
1950             1955             1960             1965

tct ttc act ggg ctg acg tca acc agt ata ttt cag gat gat tta gga      6013
Ser Phe Thr Gly Leu Thr Ser Thr Ser Ile Phe Gln Asp Asp Leu Gly
                1970             1975             1980

cct cct caa tgt aag tct att aca cta gag cga gga cca gat ggc tta      6061
Pro Pro Gln Cys Lys Ser Ile Thr Leu Glu Arg Gly Pro Asp Gly Leu
            1985             1990             1995

ggc ttc agt ata gtt gga gga tat ggc agc cct cat gga gac tta ccc      6109
Gly Phe Ser Ile Val Gly Gly Tyr Gly Ser Pro His Gly Asp Leu Pro
            2000             2005             2010

att tat gtt aaa aca gtg ttt gca aag gga gca gcc tct gaa gac gga      6157
Ile Tyr Val Lys Thr Val Phe Ala Lys Gly Ala Ala Ser Glu Asp Gly
        2015             2020             2025

cgt ctg aaa agg ggc gat cag atc att gct gtc aat ggg cag agt cta      6205
Arg Leu Lys Arg Gly Asp Gln Ile Ile Ala Val Asn Gly Gln Ser Leu
2030             2035             2040             2045

gaa gga gtc acc cat gaa gaa gct gtt gcc atc ctt aaa cgg aca aaa      6253
Glu Gly Val Thr His Glu Glu Ala Val Ala Ile Leu Lys Arg Thr Lys
                2050             2055             2060

ggc act gtc act ttg atg gtt ctc tct tgaattggct gccagaattg            6300
Gly Thr Val Thr Leu Met Val Leu Ser
                2065             2070

aaccaaccca acccctagct cacctcctac tgtaaagaga atgcactggt cctgacaatt    6360
tttatgctgt gttcagccgg gtcttcaaaa ctgtaggggg gaaataacac ttaagtttct    6420
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<400> 87
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           Met Leu Glu Ala Ile Asp Lys Asn Arg Ala Leu His Ala
            1               5                  10

gca gag cgc ttg caa acc aag ctg cga gaa cgt ggg gat gta gca aat        157
Ala Glu Arg Leu Gln Thr Lys Leu Arg Glu Arg Gly Asp Val Ala Asn
        15              20              25

gaa gac aaa ctg agc ctt ctg aag tca gtc ctg cag agc cct ctc ttc        205
Glu Asp Lys Leu Ser Leu Leu Lys Ser Val Leu Gln Ser Pro Leu Phe
 30              35              40                          45

agt cag att ctg agc ctt cag act tct gta cag cag ctg aaa gac cag        253
Ser Gln Ile Leu Ser Leu Gln Thr Ser Val Gln Gln Leu Lys Asp Gln
                50              55              60

gta aat att gca act tca gca act tca aat att gaa tat gcc cac gtt        301
Val Asn Ile Ala Thr Ser Ala Thr Ser Asn Ile Glu Tyr Ala His Val
                65              70              75

cct cat ctc agc cca gct gtg att cct act ctg caa aat gaa tcg ttt        349
Pro His Leu Ser Pro Ala Val Ile Pro Thr Leu Gln Asn Glu Ser Phe
            80              85              90

tta tta tcc cca aac aat ggg aat ctg gaa gca ctt aca gga cct ggt        397
Leu Leu Ser Pro Asn Asn Gly Asn Leu Glu Ala Leu Thr Gly Pro Gly
        95              100             105

att cca cac att aat ggg aaa cct gct tgt gat gaa ttt gat cag ctt        445
Ile Pro His Ile Asn Gly Lys Pro Ala Cys Asp Glu Phe Asp Gln Leu
110             115             120             125

atc aaa aat atg gcc cag ggt cgc cat gta gaa gtt ttt gag ctc ctc        493
Ile Lys Asn Met Ala Gln Gly Arg His Val Glu Val Phe Glu Leu Leu
                130             135             140

aaa cct cca tct gga ggc ctt ggg ttt agt gtt gtg gga cta aga agt        541
Lys Pro Pro Ser Gly Gly Leu Gly Phe Ser Val Val Gly Leu Arg Ser
                145             150             155

gaa aac aga gga gag ctg gga ata ttt gtt caa gag ata caa gag ggc        589
Glu Asn Arg Gly Glu Leu Gly Ile Phe Val Gln Glu Ile Gln Glu Gly
                160             165             170

agt gtg gcc cat aga gat gga aga ttg aaa gaa act gat caa att ctt        637
Ser Val Ala His Arg Asp Gly Arg Leu Lys Glu Thr Asp Gln Ile Leu
                175             180             185

gct atc aat gga cag gct ctt gat cag aca att aca cat cag cag gct        685
Ala Ile Asn Gly Gln Ala Leu Asp Gln Thr Ile Thr His Gln Gln Ala
190             195             200             205

atc agc atc ctg cag aaa gcc aaa gat act gtc cag cta gtt att gcc        733
Ile Ser Ile Leu Gln Lys Ala Lys Asp Thr Val Gln Leu Val Ile Ala
                210             215             220

aga ggc tca ttg cct cag ctt gtc agc ccc ata gtt tcc cgt tct cca        781
Arg Gly Ser Leu Pro Gln Leu Val Ser Pro Ile Val Ser Arg Ser Pro
                225             230             235
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tct gca gcc agc aca att tca gct cac tct aat ccg gtt cac tgg caa     829
Ser Ala Ala Ser Thr Ile Ser Ala His Ser Asn Pro Val His Trp Gln
        240             245             250

cac atg gaa acg att gaa ttg gtg aat gat gga tct ggt ttg gga ttt     877
His Met Glu Thr Ile Glu Leu Val Asn Asp Gly Ser Gly Leu Gly Phe
        255             260             265

ggc atc ata gga gga aaa gca act ggt gtg ata gta aaa acc att ctg     925
Gly Ile Ile Gly Gly Lys Ala Thr Gly Val Ile Val Lys Thr Ile Leu
270             275             280             285

cct gga gga gta gct gat cag cat ggg cgt tta tgc agt gga gac cac     973
Pro Gly Gly Val Ala Asp Gln His Gly Arg Leu Cys Ser Gly Asp His
        290             295             300

att cta aag att ggt gac aca gat cta gca gga atg agc agt gag caa     1021
Ile Leu Lys Ile Gly Asp Thr Asp Leu Ala Gly Met Ser Ser Glu Gln
        305             310             315

gta gca caa gtc ctt agg caa tgt gga aat aga gtt aag ttg atg att     1069
Val Ala Gln Val Leu Arg Gln Cys Gly Asn Arg Val Lys Leu Met Ile
        320             325             330

gca aga agt gcc ata gaa gaa cgt aca gca ccc act gct ttg ggc atc     1117
Ala Arg Ser Ala Ile Glu Glu Arg Thr Ala Pro Thr Ala Leu Gly Ile
        335             340             345

acc ctc tcc tca tcc cca act tca acg cca gag ttg cgg gtt gat gct     1165
Thr Leu Ser Ser Ser Pro Thr Ser Thr Pro Glu Leu Arg Val Asp Ala
350             355             360             365

tct act cag aaa ggt gaa gaa agt gag aca ttt gat gta gaa ctc act     1213
Ser Thr Gln Lys Gly Glu Glu Ser Glu Thr Phe Asp Val Glu Leu Thr
        370             375             380

aaa aat gtc caa gga tta gga att acc att gct ggc tac att gga gat     1261
Lys Asn Val Gln Gly Leu Gly Ile Thr Ile Ala Gly Tyr Ile Gly Asp
        385             390             395

aaa aaa ttg gaa cct tca gga atc ttt gta aag agc att aca aaa agc     1309
Lys Lys Leu Glu Pro Ser Gly Ile Phe Val Lys Ser Ile Thr Lys Ser
        400             405             410

agt gcc gtt gag cat gat gga aga atc caa att gga gac caa att ata     1357
Ser Ala Val Glu His Asp Gly Arg Ile Gln Ile Gly Asp Gln Ile Ile
        415             420             425

gca gta gat ggc aca aac ctt cag ggt ttt act aat cag caa gca gta     1405
Ala Val Asp Gly Thr Asn Leu Gln Gly Phe Thr Asn Gln Gln Ala Val
430             435             440             445

gag gta ttg cga cat aca gga caa act gtg ctc ctg aca cta atg agg     1453
Glu Val Leu Arg His Thr Gly Gln Thr Val Leu Leu Thr Leu Met Arg
        450             455             460

aga gga atg aag cag gaa gcc gag ctc atg tca agg gaa gac gtc aca     1501
Arg Gly Met Lys Gln Glu Ala Glu Leu Met Ser Arg Glu Asp Val Thr
        465             470             475
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aaa gat gca gat ttg tct cct gtt aat gcc agc ata atc aaa gaa aat      1549
Lys Asp Ala Asp Leu Ser Pro Val Asn Ala Ser Ile Ile Lys Glu Asn
        480             485             490

tat gaa aaa gat gaa gat ttt tta tct tcg acg aga aac acc aac ata      1597
Tyr Glu Lys Asp Glu Asp Phe Leu Ser Ser Thr Arg Asn Thr Asn Ile
    495             500             505

tta cca act gaa gaa gaa ggg tat cca tta ctg tca gct gag ata gaa      1645
Leu Pro Thr Glu Glu Glu Gly Tyr Pro Leu Leu Ser Ala Glu Ile Glu
510             515             520             525

gaa ata gaa gat gca caa aaa caa gaa gct gct ctg ctg aca aaa tgg      1693
Glu Ile Glu Asp Ala Gln Lys Gln Glu Ala Ala Leu Leu Thr Lys Trp
            530             535             540

caa agg att atg gga att aac tat gaa ata gtg gtg gcc cat gtg agc      1741
Gln Arg Ile Met Gly Ile Asn Tyr Glu Ile Val Val Ala His Val Ser
            545             550             555

aag ttt agt gag aac agt gga ttg ggg ata agc ctg gaa gcg aca gtg      1789
Lys Phe Ser Glu Asn Ser Gly Leu Gly Ile Ser Leu Glu Ala Thr Val
        560             565             570

gga cat cat ttt atc cga tct gtt cta cca gag ggt cct gtt gga cac      1837
Gly His His Phe Ile Arg Ser Val Leu Pro Glu Gly Pro Val Gly His
    575             580             585

agc ggg aag ctc ttc agt gga gac gag cta ttg gaa gta aat ggc ata      1885
Ser Gly Lys Leu Phe Ser Gly Asp Glu Leu Leu Glu Val Asn Gly Ile
590             595             600             605

act tta ctt ggg gaa aat cac caa gat gtg gtg aat atc tta aaa gaa      1933
Thr Leu Leu Gly Glu Asn His Gln Asp Val Val Asn Ile Leu Lys Glu
            610             615             620

ctg cct ata gaa gtg aca atg gtg tgc tgt cgt cga act gtg cca ccc      1981
Leu Pro Ile Glu Val Thr Met Val Cys Cys Arg Arg Thr Val Pro Pro
            625             630             635

acc acc caa tca gaa ttg gat agc ctg gac tta tgt gat att gag cta      2029
Thr Thr Gln Ser Glu Leu Asp Ser Leu Asp Leu Cys Asp Ile Glu Leu
        640             645             650

aca gaa aag cct cac gta gat cta ggt gag ttc atc ggg tca tca gag      2077
Thr Glu Lys Pro His Val Asp Leu Gly Glu Phe Ile Gly Ser Ser Glu
        655             660             665

cca gag gat cca gtg ctg gcg atg act gat gcg ggt cag agt aca gaa      2125
Pro Glu Asp Pro Val Leu Ala Met Thr Asp Ala Gly Gln Ser Thr Glu
670             675             680             685

gag gtt caa gca cct ttg gcc atg tgg gag gct ggc att cag cac ata      2173
Glu Val Gln Ala Pro Leu Ala Met Trp Glu Ala Gly Ile Gln His Ile
            690             695             700

atg ctg gag aaa ggg agc aaa gga ctt ggt ttt agc att tta gat tat      2221
Met Leu Glu Lys Gly Ser Lys Gly Leu Gly Phe Ser Ile Leu Asp Tyr
            705             710             715
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cag gat cca att gat cca gca agc act gtg att ata att cgt tct ttg      2269
Gln Asp Pro Ile Asp Pro Ala Ser Thr Val Ile Ile Ile Arg Ser Leu
        720             725                 730

gtg cct ggc ggc att gct gaa aag gat gga cga ctt ctt cct ggt gac      2317
Val Pro Gly Gly Ile Ala Glu Lys Asp Gly Arg Leu Leu Pro Gly Asp
        735             740                 745

cga ctc atg ttt gta aac gat gtt aac ttg gaa aac agc agt ctt gag      2365
Arg Leu Met Phe Val Asn Asp Val Asn Leu Glu Asn Ser Ser Leu Glu
750             755                 760                 765

gaa gct gta gaa gca ctg aag gga gca ccg tca ggg act gtg aga ata      2413
Glu Ala Val Glu Ala Leu Lys Gly Ala Pro Ser Gly Thr Val Arg Ile
                770             775                 780

gga gtt gct aag cct tta ccc ctt tca cca gaa gaa ggt tat gtt tct      2461
Gly Val Ala Lys Pro Leu Pro Leu Ser Pro Glu Glu Gly Tyr Val Ser
                785             790                 795

gct aag gag gat tcc ttt ctc tac cca cca cac tcc tgt gag gaa gca      2509
Ala Lys Glu Asp Ser Phe Leu Tyr Pro Pro His Ser Cys Glu Glu Ala
            800             805                 810

ggg ctg gct gac aaa ccc ctc ttc agg gct gac ttg gct ctg gtg ggc      2557
Gly Leu Ala Asp Lys Pro Leu Phe Arg Ala Asp Leu Ala Leu Val Gly
        815             820                 825

aca aat gat gct gac tta gta gat gaa tcc aca ttt gag tct cca tac      2605
Thr Asn Asp Ala Asp Leu Val Asp Glu Ser Thr Phe Glu Ser Pro Tyr
830             835                 840                 845

tct cct gaa aat gac agc atc tac tct act caa gcc tct att tta tct      2653
Ser Pro Glu Asn Asp Ser Ile Tyr Ser Thr Gln Ala Ser Ile Leu Ser
                850             855                 860

ctt cat ggc agt tct tgt ggt gat ggc ctg aac tat ggt tct tcc ctt      2701
Leu His Gly Ser Ser Cys Gly Asp Gly Leu Asn Tyr Gly Ser Ser Leu
            865             870                 875

cca tca tct cct cct aag gat gtt att gaa aat tct tgt gat cca gta      2749
Pro Ser Ser Pro Pro Lys Asp Val Ile Glu Asn Ser Cys Asp Pro Val
            880             885                 890

ctt gat ctg cat atg tct ctg gag gaa cta tat acc cag aat ctc ctg      2797
Leu Asp Leu His Met Ser Leu Glu Glu Leu Tyr Thr Gln Asn Leu Leu
        895             900                 905

gaa aga cag gat gag aat aca cct tcg gtg gac ata agt atg ggg cct      2845
Glu Arg Gln Asp Glu Asn Thr Pro Ser Val Asp Ile Ser Met Gly Pro
910             915                 920                 925

gct tct ggc ttt act ata aat gac tac aca cct gca aat gct att gaa      2893
Ala Ser Gly Phe Thr Ile Asn Asp Tyr Thr Pro Ala Asn Ala Ile Glu
                930             935                 940

caa caa tat gaa tgt gaa aac aca ata gtg tgg act gaa tct cat tta      2941
Gln Gln Tyr Glu Cys Glu Asn Thr Ile Val Trp Thr Glu Ser His Leu
                945             950                 955
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cca agt gaa gtt ata tca agt gca gaa ctt cct tct gtg cta ccc gat      2989
Pro Ser Glu Val Ile Ser Ser Ala Glu Leu Pro Ser Val Leu Pro Asp
        960             965             970

tca gct gga aag ggc tct gag cac ctg ctt gaa cag agc tcc ctg gcc      3037
Ser Ala Gly Lys Gly Ser Glu His Leu Leu Glu Gln Ser Ser Leu Ala
        975             980             985

tgt aat gct gag tgt gtc atg ctt caa aat gta tct aaa gaa tct ttt      3085
Cys Asn Ala Glu Cys Val Met Leu Gln Asn Val Ser Lys Glu Ser Phe
 990             995             1000            1005

gaa agg act att aat ata gca aaa ggc aat tct agc cta gga atg aca      3133
Glu Arg Thr Ile Asn Ile Ala Lys Gly Asn Ser Ser Leu Gly Met Thr
                1010            1015            1020

gtt agt gct aat aaa gat ggc ttg ggg atg atc gtt cga agc att att      3181
Val Ser Ala Asn Lys Asp Gly Leu Gly Met Ile Val Arg Ser Ile Ile
        1025            1030            1035

cat gga ggt gcc att agt cga gat ggc cgg att gcc att ggg gac tgc      3229
His Gly Gly Ala Ile Ser Arg Asp Gly Arg Ile Ala Ile Gly Asp Cys
        1040            1045            1050

atc ttg tcc att aat gaa gag tct acc atc agt gta acc aat gcc cag      3277
Ile Leu Ser Ile Asn Glu Glu Ser Thr Ile Ser Val Thr Asn Ala Gln
        1055            1060            1065

gca cga gct atg ttg aga aga cat tct ctc att ggc cct gac ata aaa      3325
Ala Arg Ala Met Leu Arg Arg His Ser Leu Ile Gly Pro Asp Ile Lys
1070            1075            1080            1085

att act tat gtg cct gca gaa cat ttg gaa gag ttc aaa ata agc ttg      3373
Ile Thr Tyr Val Pro Ala Glu His Leu Glu Glu Phe Lys Ile Ser Leu
                1090            1095            1100

gga caa caa tct gga aga gta atg gca ctg gat att ttt tct tca tac      3421
Gly Gln Gln Ser Gly Arg Val Met Ala Leu Asp Ile Phe Ser Ser Tyr
                1105            1110            1115

act ggc aga gac att cca gaa tta cca gag cga gaa gag gga gag ggt      3469
Thr Gly Arg Asp Ile Pro Glu Leu Pro Glu Arg Glu Glu Gly Glu Gly
        1120            1125            1130

gaa gaa agc gaa ctt caa aac aca gca tat agc aat tgg aat cag ccc      3517
Glu Glu Ser Glu Leu Gln Asn Thr Ala Tyr Ser Asn Trp Asn Gln Pro
        1135            1140            1145

agg cgg gtg gaa ctc tgg aga gaa cca agc aaa tcc tta ggc atc agc      3565
Arg Arg Val Glu Leu Trp Arg Glu Pro Ser Lys Ser Leu Gly Ile Ser
1150            1155            1160            1165

att gtt ggt gga cga ggg atg ggg agt cgg cta agc aat gga gaa gtg      3613
Ile Val Gly Gly Arg Gly Met Gly Ser Arg Leu Ser Asn Gly Glu Val
                1170            1175            1180

atg agg ggc att ttc atc aaa cat gtt ctg gaa gat agt cca gct ggc      3661
Met Arg Gly Ile Phe Ile Lys His Val Leu Glu Asp Ser Pro Ala Gly
        1185            1190            1195
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aaa aat gga acc ttg aaa cct gga gat aga atc gta gag gtg gat gga      3709
Lys Asn Gly Thr Leu Lys Pro Gly Asp Arg Ile Val Glu Val Asp Gly
        1200                 1205                 1210


atg gac ctc aga gat gca agc cat gaa caa gct gtg gaa gcc att cgg      3757
Met Asp Leu Arg Asp Ala Ser His Glu Gln Ala Val Glu Ala Ile Arg
        1215                 1220                 1225


aaa gca ggc aac cct gta gtc ttt atg gta tagagcttta ttacagacca       3807
Lys Ala Gly Asn Pro Val Val Phe Met Val
1230                 1235


agggcaccca gtcagtcagt cagagtcaga gtcagagtca gagccagaga aggctccatt   3867
gtgcagtgtg cccccacccc ctccttcagc ctttgccgaa atgggtagtg atcacacaca   3927
gtcatctgca agcaaaatct cacaagatgt ggacaaagag gatgagtttg gttacagctg   3987
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gaaaggtcat agtggtttgg gcctaagtct tgctgggaac aaagaccgat ccaggatgag   4107
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<210> 88
<211> 763
<212> PRT
<213> Homo sapiens

<400> 88
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1               5                   10                  15
Val Asp Lys Glu Asp Glu Phe Gly Tyr Ser Trp Lys Asn Ile Arg Glu
            20                  25                  30
Arg Tyr Gly Thr Leu Thr Gly Glu Leu His Met Ile Glu Leu Glu Lys
        35                  40                  45
Gly His Ser Gly Leu Gly Leu Ser Leu Ala Gly Asn Lys Asp Arg Ser
    50                  55                  60
Arg Met Ser Val Phe Ile Val Gly Ile Asp Pro Asn Gly Ala Ala Gly
65              70                  75                  80
Lys Asp Gly Arg Leu Gln Ile Ala Asp Glu Leu Leu Glu Ile Asn Gly
            85                  90                  95
Gln Ile Leu Tyr Gly Arg Ser His Gln Asn Ala Ser Ser Ile Ile Lys
        100                 105                 110
Cys Ala Pro Ser Lys Val Lys Ile Ile Phe Ile Arg Asn Lys Asp Ala
        115                 120                 125
Val Asn Gln Met Ala Val Cys Pro Gly Asn Ala Val Glu Pro Leu Pro
    130                 135                 140
Ser Asn Ser Glu Asn Leu Gln Asn Lys Glu Pro Glu Pro Thr Val Thr
145                 150                 155                 160
Thr Ser Asp Ala Ala Val Asp Leu Ser Ser Phe Lys Asn Val Gln His
            165                 170                 175
Leu Glu Leu Pro Lys Asp Gln Gly Gly Leu Gly Ile Ala Ile Ser Glu
        180                 185                 190
Glu Asp Thr Leu Ser Gly Val Ile Ile Lys Ser Leu Thr Glu His Gly
    195                 200                 205
Val Ala Ala Thr Asp Gly Arg Leu Lys Val Gly Asp Gln Ile Leu Ala
    210                 215                 220
Val Asp Asp Glu Ile Val Val Gly Tyr Pro Ile Glu Lys Phe Ile Ser
225                 230                 235                 240
Leu Leu Lys Thr Ala Lys Met Thr Val Lys Leu Thr Ile His Ala Glu
            245                 250                 255
Asn Pro Asp Ser Gln Ala Val Pro Ser Ala Ala Gly Ala Ala Ser Gly
            260                 265                 270
Glu Lys Lys Asn Ser Ser Gln Ser Leu Met Val Pro Gln Ser Gly Ser
        275                 280                 285
Pro Glu Pro Glu Ser Ile Arg Asn Thr Ser Arg Ser Ser Thr Pro Ala
    290                 295                 300
Ile Phe Ala Ser Asp Pro Ala Thr Cys Pro Ile Ile Pro Gly Cys Glu
305                 310                 315                 320
Thr Thr Ile Glu Ile Ser Lys Gly Arg Thr Gly Leu Gly Leu Ser Ile
            325                 330                 335
Val Gly Gly Ser Asp Thr Leu Leu Gly Ala Phe Ile Ile His Glu Val
        340                 345                 350
Tyr Glu Glu Gly Ala Ala Cys Lys Asp Gly Arg Leu Trp Ala Gly Asp
        355                 360                 365
Gln Ile Leu Glu Val Asn Gly Ile Asp Leu Arg Lys Ala Thr His Asp
    370                 375                 380
Glu Ala Ile Asn Val Leu Arg Gln Thr Pro Gln Arg Val Arg Leu Thr
385                 390                 395                 400
Leu Tyr Arg Asp Glu Ala Pro Tyr Lys Glu Glu Val Cys Asp Thr
        405                 410                 415
Leu Thr Ile Glu Leu Gln Lys Lys Pro Gly Lys Gly Leu Gly Leu Ser
        420                 425                 430
Ile Val Gly Lys Arg Asn Asp Thr Gly Val Phe Val Ser Asp Ile Val
        435                 440                 445
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Lys Gly Gly Ile Ala Asp Pro Asp Gly Arg Leu Ile Gln Gly Asp Gln
    450                 455                 460
Ile Leu Leu Val Asn Gly Glu Asp Val Arg Asn Ala Ser Gln Glu Ala
465             470                 475                 480
Val Ala Ala Leu Leu Lys Cys Ser Leu Gly Thr Val Thr Leu Glu Val
            485                 490                 495
Gly Arg Ile Lys Ala Gly Pro Phe His Ser Glu Arg Arg Pro Ser Gln
        500                 505                 510
Thr Ser Gln Val Ser Glu Gly Ser Leu Ser Ser Phe Thr Phe Pro Leu
    515                 520                 525
Ser Gly Ser Ser Thr Ser Glu Ser Leu Glu Ser Ser Ser Lys Lys Asn
    530                 535                 540
Ala Leu Ala Ser Glu Ile Gln Gly Leu Arg Thr Val Glu Met Lys Lys
545             550                 555                 560
Gly Pro Thr Asp Ser Leu Gly Ile Ser Ile Ala Gly Gly Val Gly Ser
            565                 570                 575
Pro Leu Gly Asp Val Pro Ile Phe Ile Ala Met Met His Pro Thr Gly
            580                 585                 590
Val Ala Ala Gln Thr Gln Lys Leu Arg Val Gly Asp Arg Ile Val Thr
    595                 600                 605
Ile Cys Gly Thr Ser Thr Glu Gly Met Thr His Thr Gln Ala Val Asn
    610                 615                 620
Leu Leu Lys Asn Ala Ser Gly Ser Ile Glu Met Gln Val Val Ala Gly
625             630                 635                 640
Gly Asp Val Ser Val Val Thr Gly His His Gln Glu Pro Ala Ser Ser
            645                 650                 655
Ser Leu Ser Phe Thr Gly Leu Thr Ser Thr Ser Ile Phe Gln Asp Asp
            660                 665                 670
Leu Gly Pro Pro Gln Cys Lys Ser Ile Thr Leu Glu Arg Gly Pro Asp
        675                 680                 685
Gly Leu Gly Phe Ser Ile Val Gly Gly Tyr Gly Ser Pro His Gly Asp
        690                 695                 700
Leu Pro Ile Tyr Val Lys Thr Val Phe Ala Lys Gly Ala Ala Ser Glu
705             710                 715                 720
Asp Gly Arg Leu Lys Arg Gly Asp Gln Ile Ile Ala Val Asn Gly Gln
            725                 730                 735
Ser Leu Glu Gly Val Thr His Glu Glu Ala Val Ala Ile Leu Lys Arg
        740                 745                 750
Thr Lys Gly Thr Val Thr Leu Met Val Leu Ser
        755                 760
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<210> 89
<211> 590
<212> PRT
<213> Homo sapiens

<400> 89
```
Ile Thr His Gln Gln Ala Ile Ser Ile Leu Gln Lys Ala Lys Asp Thr
1               5                   10                  15
Val Gln Leu Val Ile Ala Arg Gly Ser Leu Pro Gln Leu Val Ser Pro
            20                  25                  30
Ile Val Ser Arg Ser Pro Ser Ala Ala Ser Thr Ile Ser Ala His Ser
        35                  40                  45
Asn Pro Val His Trp Gln His Met Glu Thr Ile Glu Leu Val Asn Asp
    50                  55                  60
Gly Ser Gly Leu Gly Phe Gly Ile Ile Gly Gly Lys Ala Thr Gly Val
65              70                  75                  80
Ile Val Lys Thr Ile Leu Pro Gly Gly Val Ala Asp Gln His Gly Arg
            85                  90                  95
Leu Cys Ser Gly Asp His Ile Leu Lys Ile Gly Asp Thr Asp Leu Ala
        100                 105                 110
```

Gly Met Ser Ser Glu Gln Val Ala Gln Val Leu Arg Gln Cys Gly Asn
        115   120   125

Arg Val Lys Leu Met Ile Ala Arg Ser Ala Ile Glu Glu Arg Thr Ala
        130   135   140

Pro Thr Ala Leu Gly Ile Thr Leu Ser Ser Ser Pro Thr Ser Thr Pro
145   150   155   160

Glu Leu Arg Val Asp Ala Ser Thr Gln Lys Gly Glu Glu Ser Glu Thr
            165   170   175

Phe Asp Val Glu Leu Thr Lys Asn Val Gln Gly Leu Gly Ile Thr Ile
        180   185   190

Ala Gly Tyr Ile Gly Asp Lys Lys Leu Glu Pro Ser Gly Ile Phe Val
        195   200   205

Lys Ser Ile Thr Lys Ser Ser Ala Val Glu His Asp Gly Arg Ile Gln
    210   215   220

Ile Gly Asp Gln Ile Ile Ala Val Asp Gly Thr Asn Leu Gln Gly Phe
225   230   235   240

Thr Asn Gln Gln Ala Val Glu Val Leu Arg His Thr Gly Gln Thr Val
            245   250   255

Leu Leu Thr Leu Met Arg Arg Gly Met Lys Gln Glu Ala Glu Leu Met
            260   265   270

Ser Arg Glu Asp Val Thr Lys Asp Ala Asp Leu Ser Pro Val Asn Ala
    275   280   285

Ser Ile Ile Lys Glu Asn Tyr Glu Lys Asp Glu Asp Phe Leu Ser Ser
    290   295   300

Thr Arg Asn Thr Asn Ile Leu Pro Thr Glu Glu Glu Gly Tyr Pro Leu
305   310   315   320

Leu Ser Ala Glu Ile Glu Glu Ile Glu Asp Ala Gln Lys Gln Glu Ala
            325   330   335

Ala Leu Leu Thr Lys Trp Gln Arg Ile Met Gly Ile Asn Tyr Glu Ile
            340   345   350

Val Val Ala His Val Ser Lys Phe Ser Glu Asn Ser Gly Leu Gly Ile
        355   360   365

Ser Leu Glu Ala Thr Val Gly His His Phe Ile Arg Ser Val Leu Pro
    370   375   380

Glu Gly Pro Val Gly His Ser Gly Lys Leu Phe Ser Gly Asp Glu Leu
385   390   395   400

Leu Glu Val Asn Gly Ile Thr Leu Leu Gly Glu Asn His Gln Asp Val
            405   410   415

Val Asn Ile Leu Lys Glu Leu Pro Ile Glu Val Thr Met Val Cys Cys
            420   425   430

Arg Arg Thr Val Pro Pro Thr Thr Gln Ser Glu Leu Asp Ser Leu Asp
        435   440   445

Leu Cys Asp Ile Glu Leu Thr Glu Lys Pro His Val Asp Leu Gly Glu
    450   455   460

Phe Ile Gly Ser Ser Glu Pro Glu Asp Pro Val Leu Ala Met Thr Asp
465   470   475   480

Ala Gly Gln Ser Thr Glu Glu Val Gln Ala Pro Leu Ala Met Trp Glu
            485   490   495

Ala Gly Ile Gln His Ile Met Leu Glu Lys Gly Ser Lys Gly Leu Gly
        500   505   510

Phe Ser Ile Leu Asp Tyr Gln Asp Pro Ile Asp Pro Ala Ser Thr Val
    515   520   525

Ile Ile Ile Arg Ser Leu Val Pro Gly Gly Ile Ala Glu Lys Asp Gly
    530   535   540

Arg Leu Leu Pro Gly Asp Arg Leu Met Phe Val Asn Asp Val Asn Leu
545   550   555   560

Glu Asn Ser Ser Leu Glu Glu Ala Val Glu Ala Leu Lys Gly Ala Pro
            565   570   575

Ser Gly Thr Val Arg Ile Gly Val Ala Lys Pro Leu Pro Leu
            580   585   590

<210> 90
<211> 235
<212> PRT
<213> Homo sapiens

<400> 90
```
Met Leu Glu Ala Ile Asp Lys Asn Arg Ala Leu His Ala Ala Glu Arg
1               5                   10                  15
Leu Gln Thr Lys Leu Arg Glu Arg Gly Asp Val Ala Asn Glu Asp Lys
            20                  25                  30
Leu Ser Leu Leu Lys Ser Val Leu Gln Ser Pro Leu Phe Ser Gln Ile
            35                  40                  45
Leu Ser Leu Gln Thr Ser Val Gln Gln Leu Lys Asp Gln Val Asn Ile
        50                  55                  60
Ala Thr Ser Ala Thr Ser Asn Ile Glu Tyr Ala His Val Pro His Leu
65                  70                  75                  80
Ser Pro Ala Val Ile Pro Thr Leu Gln Asn Glu Ser Phe Leu Leu Ser
                85                  90                  95
Pro Asn Asn Gly Asn Leu Glu Ala Leu Thr Gly Pro Gly Ile Pro His
            100                 105                 110
Ile Asn Gly Lys Pro Ala Cys Asp Glu Phe Asp Gln Leu Ile Lys Asn
            115                 120                 125
Met Ala Gln Gly Arg His Val Glu Val Phe Glu Leu Leu Lys Pro Pro
    130                 135                 140
Ser Gly Gly Leu Gly Phe Ser Val Val Gly Leu Arg Ser Glu Asn Arg
145                 150                 155                 160
Gly Glu Leu Gly Ile Phe Val Gln Glu Ile Gln Glu Gly Ser Val Ala
                165                 170                 175
His Arg Asp Gly Arg Leu Lys Glu Thr Asp Gln Ile Leu Ala Ile Asn
            180                 185                 190
Gly Gln Ala Leu Asp Gln Thr Ile Thr His Gln Gln Ala Ile Ser Ile
            195                 200                 205
Leu Gln Lys Ala Lys Asp Thr Val Gln Leu Val Ile Ala Arg Gly Ser
    210                 215                 220
Leu Pro Gln Leu Val Ser Pro Ile Val Ser Arg
225                 230                 235
```

<210> 91
<211> 251
<212> PRT
<213> Homo sapiens

<400> 91
```
Pro Ser Val Leu Pro Asp Ser Ala Gly Lys Gly Ser Glu Tyr Leu Leu
1               5                   10                  15
Glu Gln Ser Ser Leu Ala Cys Asn Ala Glu Cys Val Met Leu Gln Asn
            20                  25                  30
Val Ser Lys Glu Ser Phe Glu Arg Thr Ile Asn Ile Ala Lys Gly Asn
            35                  40                  45
Ser Ser Leu Gly Met Thr Val Ser Ala Asn Lys Asp Gly Leu Gly Met
        50                  55                  60
Ile Val Arg Ser Ile Ile His Gly Gly Ala Ile Ser Arg Asp Gly Arg
65                  70                  75                  80
Ile Ala Ile Gly Asp Cys Ile Leu Ser Ile Asn Glu Glu Ser Thr Ile
                85                  90                  95
Ser Val Thr Asn Ala Gln Ala Arg Ala Met Leu Arg Arg His Ser Leu
            100                 105                 110
Ile Gly Pro Asp Ile Lys Ile Thr Tyr Val Pro Ala Glu His Leu Glu
            115                 120                 125
Glu Phe Lys Ile Ser Leu Gly Gln Gln Ser Gly Arg Val Met Ala Leu
    130                 135                 140
```

```
Asp Ile Phe Ser Ser Tyr Thr Gly Arg Asp Ile Pro Glu Leu Pro Glu
145             150             155             160
Arg Glu Glu Gly Glu Gly Glu Glu Ser Glu Leu Gln Asn Thr Ala Tyr
                165             170             175
Ser Asn Trp Asn Gln Pro Arg Arg Val Glu Leu Trp Arg Glu Pro Ser
            180             185             190
Lys Ser Leu Gly Ile Ser Ile Val Gly Gly Arg Gly Met Gly Ser Arg
            195             200             205
Leu Ser Asn Gly Glu Val Met Arg Gly Ile Phe Ile Lys His Val Leu
    210             215             220
Glu Asp Ser Pro Ala Gly Lys Asn Gly Thr Leu Lys Pro Gly Asp Arg
225             230             235             240
Ile Val Glu Ala Pro Ser Gln Ser Glu Ser Glu
            245             250
```

<210> 92
<211> 272
<212> PRT
<213> Homo sapiens

<400> 92
```
Pro Ser Val Leu Pro Asp Ser Ala Gly Lys Gly Ser Glu Tyr Leu Leu
  1             5             10              15
Glu Gln Ser Ser Leu Ala Cys Asn Ala Glu Cys Val Met Leu Gln Asn
            20              25              30
Val Ser Lys Glu Ser Phe Glu Arg Thr Ile Asn Ile Ala Lys Gly Asn
        35              40              45
Ser Ser Leu Gly Met Thr Val Ser Ala Asn Lys Asp Gly Leu Gly Met
    50              55              60
Ile Val Arg Ser Ile Ile His Gly Gly Ala Ile Ser Arg Asp Gly Arg
 65              70              75              80
Ile Ala Ile Gly Asp Cys Ile Leu Ser Ile Asn Glu Glu Ser Thr Ile
            85              90              95
Ser Val Thr Asn Ala Gln Ala Arg Ala Met Leu Arg Arg His Ser Leu
            100             105             110
Ile Gly Pro Asp Ile Lys Ile Thr Tyr Val Pro Ala Glu His Leu Glu
        115             120             125
Glu Phe Lys Ile Ser Leu Gly Gln Gln Ser Gly Arg Val Met Ala Leu
    130             135             140
Asp Ile Phe Ser Ser Tyr Thr Gly Arg Asp Ile Pro Glu Leu Pro Glu
145             150             155             160
Arg Glu Glu Gly Glu Gly Glu Glu Ser Glu Leu Gln Asn Thr Ala Tyr
                165             170             175
Ser Asn Trp Asn Gln Pro Arg Arg Val Glu Leu Trp Arg Glu Pro Ser
            180             185             190
Lys Ser Leu Gly Ile Ser Ile Val Gly Gly Arg Gly Met Gly Ser Arg
            195             200             205
Leu Ser Asn Gly Glu Val Met Arg Gly Ile Phe Ile Lys His Val Leu
    210             215             220
Glu Asp Ser Pro Ala Gly Lys Asn Gly Thr Leu Lys Pro Gly Asp Arg
225             230             235             240
Ile Val Glu Val Asp Gly Met Asp Leu Arg Asp Ala Ser His Glu Gln
            245             250             255
Ala Val Glu Ala Ile Arg Lys Ala Gly Asn Pro Val Val Phe Met Val
        260             265             270
```

<210> 93
<211> 321
<212> PRT
<213> Homo sapiens

<400> 93

```
Pro Ser Val Leu Pro Asp Ser Ala Gly Lys Gly Ser Glu Tyr Leu Leu
1               5                   10              15
Glu Gln Ser Ser Leu Ala Cys Asn Ala Glu Cys Val Met Leu Gln Asn
            20                  25              30
Val Ser Lys Glu Ser Phe Glu Arg Thr Ile Asn Ile Ala Lys Gly Asn
        35                  40              45
Ser Ser Leu Gly Met Thr Val Ser Ala Asn Lys Asp Gly Leu Gly Met
    50                  55              60
Ile Val Arg Ser Ile Ile His Gly Gly Ala Ile Ser Arg Asp Gly Arg
65                  70              75                  80
Ile Ala Ile Gly Asp Cys Ile Leu Ser Ile Asn Glu Glu Ser Thr Ile
            85                  90                  95
Ser Val Thr Asn Ala Gln Ala Arg Ala Met Leu Arg Arg His Ser Leu
            100                 105             110
Ile Gly Pro Asp Ile Lys Ile Thr Tyr Val Pro Ala Glu His Leu Glu
        115                 120             125
Glu Phe Lys Ile Ser Leu Gly Gln Gln Ser Gly Arg Val Met Ala Leu
    130                 135             140
Asp Ile Phe Ser Ser Tyr Thr Gly Arg Asp Ile Pro Glu Leu Pro Glu
145                 150             155                 160
Arg Glu Glu Gly Glu Gly Glu Glu Ser Glu Leu Gln Asn Thr Ala Tyr
            165                 170             175
Ser Asn Trp Asn Gln Pro Arg Arg Val Glu Leu Trp Arg Glu Pro Ser
            180                 185             190
Lys Ser Leu Gly Ile Ser Ile Val Gly Gly Arg Gly Met Gly Ser Arg
    195                 200             205
Leu Ser Asn Gly Glu Val Met Arg Gly Ile Phe Ile Lys His Val Leu
    210                 215             220
Glu Asp Ser Pro Ala Gly Lys Asn Gly Thr Leu Lys Pro Gly Asp Arg
225                 230             235                 240
Ile Val Glu Val Asp Gly Met Asp Leu Arg Asp Ala Ser His Glu Gln
            245                 250             255
Ala Val Glu Ala Ile Arg Lys Ala Gly Asn Pro Val Val Phe Met Val
            260                 265             270
Gln Ser Ile Ile Asn Arg Pro Arg Lys Ser Pro Leu Pro Ser Leu Leu
    275                 280             285
His Asn Leu Tyr Pro Lys Tyr Asn Phe Ser Ser Thr Asn Pro Phe Ala
    290                 295             300
Asp Ser Leu Gln Ile Asn Ala Asp Lys Ala Pro Ser Gln Ser Glu Ser
305                 310             315                 320
Glu
```